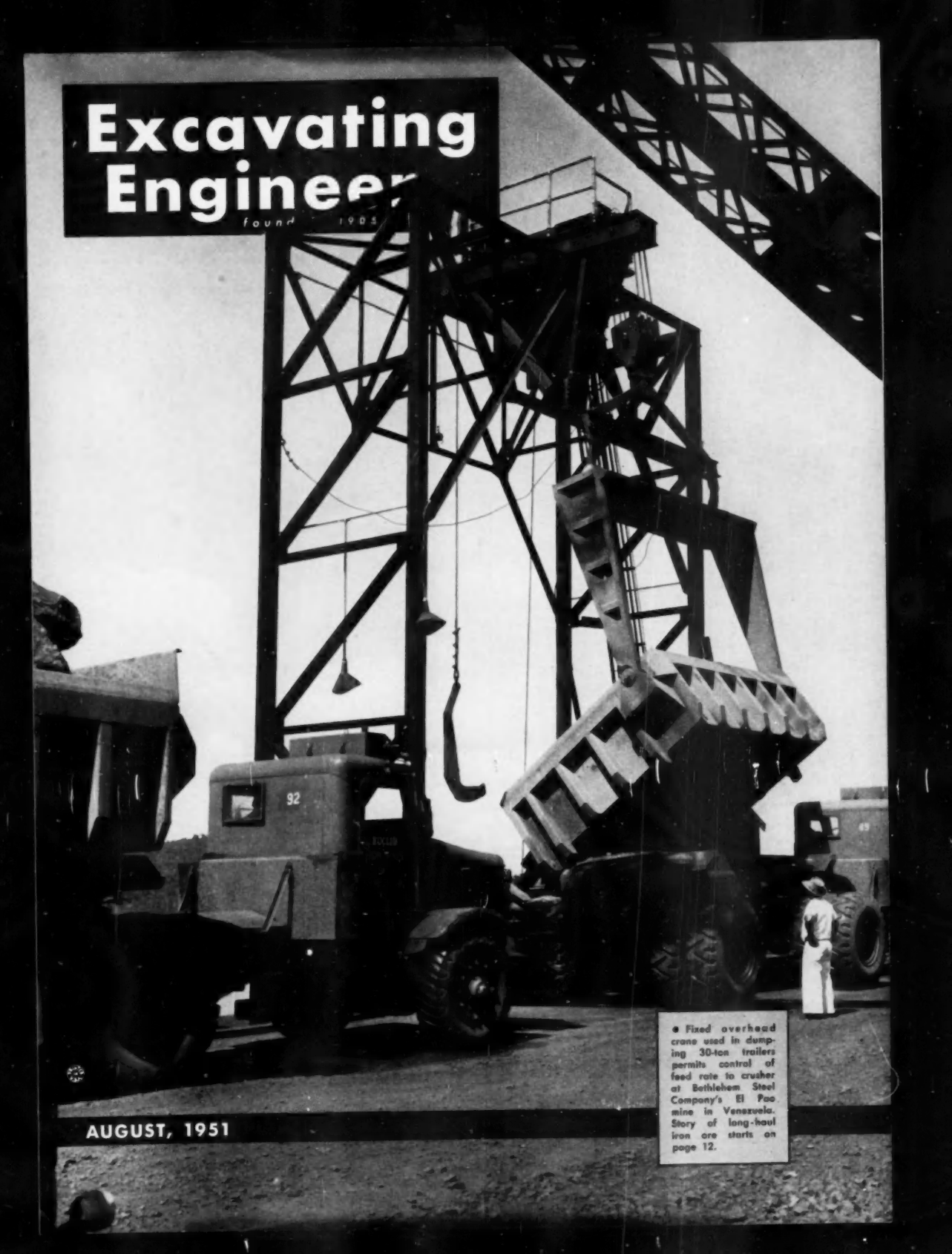
Excavating Engineer

found 1905



• Fixed overhead crane used in dumping 30-ton trailers permits control of feed rate to crusher at Bethlehem Steel Company's El Pao mine in Venezuela. Story of long-haul iron ore starts on page 12.

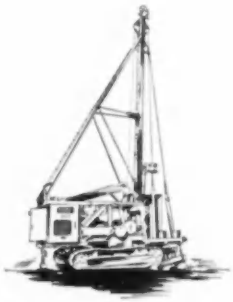
AUGUST, 1951

RAMROD PUNCH WITH A SHATTERING SNAP

That's

BUCYRUS ERIE

DRILLING ACTION



NOTED for fast penetration, hard-hitting Bucyrus-Erie Blast Hole Drills ram down 5⅜-in. to 12-in. diameter holes in short order — save hours of blast preparation time. High speed penetration is the result of two main factors:

1. BALANCED DRILLING MOTION

Bucyrus-Erie Blast Hole Drills are scientifically designed to provide the most effective combination of tool weight, blows per minute and length of stroke. The result is a balanced motion that produces outstanding hole footage even in the toughest drilling.

2. SHATTERING SNAP-BACK

Key to the super-shattering action of every blow is the snap-back of the bit provided by a rubber shock absorber — a Bucyrus-Erie first, and the most successful drilling rig shock-absorber yet devised. As the tools travel down, the discs compress. The instant the bit strikes, the discs expand and snap the tools away from the hole bottom, thus giving a sharp, smashing blow instead of a "dead" hit.

But fast hole penetration is only part of Bucyrus-Erie's low-cost drilling story. Let us send you all the details.

22-T	5⅝"	to	6⅝"	holes
27-T	6"	to	6¾"	holes
29-T	6⅝"	to	9"	holes
42-T	9"	to	12"	holes

BUCYRUS ERIE

400510

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SURE-GRIP
Tops for drive-wheel traction
HARD ROCK LUG
Super-tough champ for all types of rock work
HARD ROCK RIB
Companion tire for front wheels in rock work
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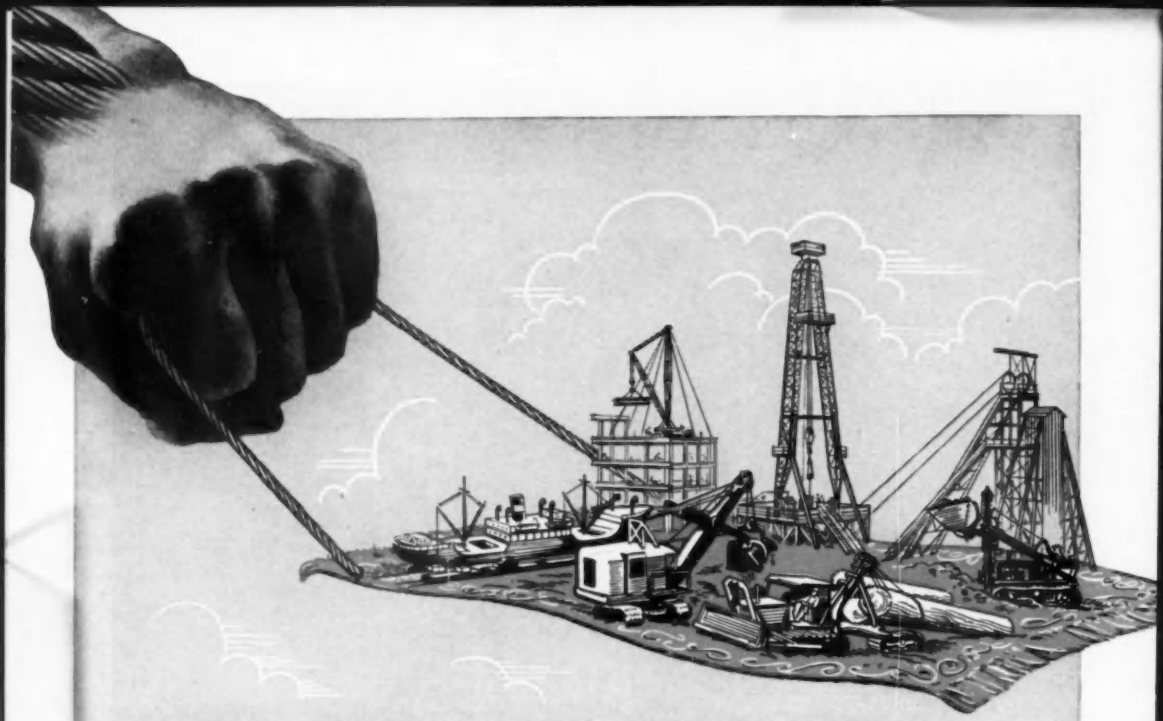
It must pay to
Buy and Specify

GOODYEAR

BECAUSE MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND!

Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio



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- *HANDLES EASIER*
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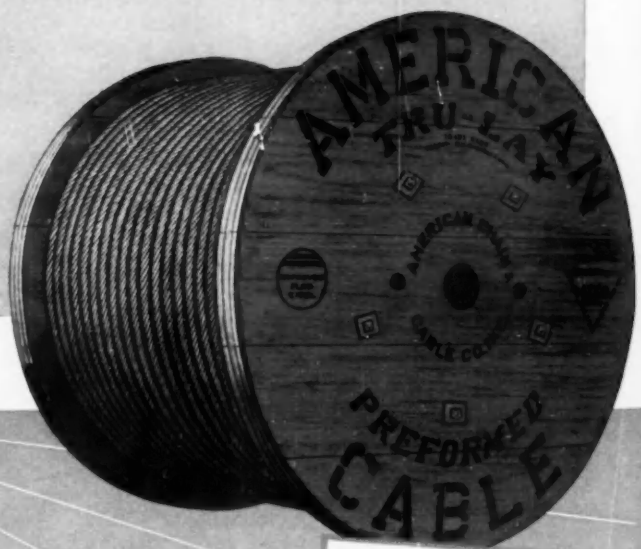
ALL AROUND AMERICA



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Excavating Engineer

founded 1905

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WIRE ROPE

A thousand and one **to order from assures the right rope for your equipment**

It will pay you to get Macwhyte Wire Rope, engineered and job-proved for your particular equipment. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company. You get the correct wire rope for your equipment when you buy Macwhyte.

MACWHYTE COMPANY, 2903 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Plow Steel Monarch Whyte Strand Wire Rope. Copy sent on request.

3009

You can't have all NORTHWEST ADVANTAGES unless you own a NORTHWEST

Northwest positive traction while turning as well as when going straight ahead permits Northwests to travel where others have difficulty. Travel gears are fully enclosed and run in oil.

Northwest Dual Independent Crowd *utilizes force other independent crowd shovels waste!* Northwest Shovel Boom is powerful—all welded—proved in rock digging!

Uniform Pressure Swing Clutches give smoother engagement, better control, less adjustment and longer life.

"Feather-Touch" Clutch Control utilizes engine power to throw heavy clutches and reduces day-end fatigue.

Cast Steel Bases with Cast Steel Machinery Side Frames are typical of Northwest design for permanence of shaft alignment and rigidity.

Ball and roller bearings on all high-speed shafts always have been standard equipment on Northwests.

Cushion Clutch eliminates the effects of shock overloads to parts under power.

All Northwests are easily convertible from Shovel to Crane, Dragline or Pullshovel.

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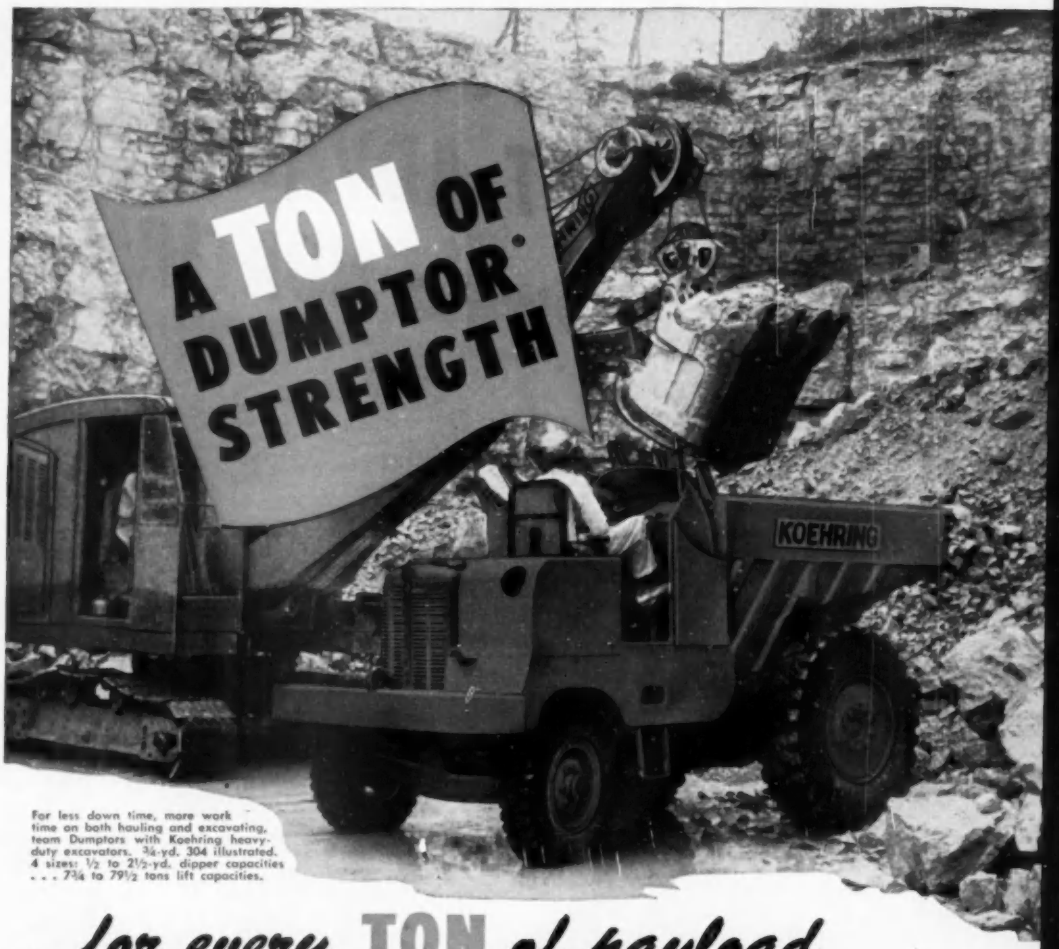
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



For less down time, more work time on both hauling and excavating, team Dumptors with Koehring heavy-duty excavators. ¾-yd. 304 illustrated. 4 sizes: ½ to 2½-yd. dipper capacities . . . 7¾ to 79½ tons lift capacities.

. . . for every TON of payload

Dumptors stand up under the severest shocks of shovel-loading 1½ to 2½ yards of rock at a pass because they're built extra tough for rock handling. There's more than a ton of net vehicle weight for every ton of payload.

All-welded body, sides, ends and bottom are heavily reinforced with 4" channel ribs. More than triple strength has been built into the bottom . . . seasoned 1⅝" oak timbers are securely bolted between two layers of 5/16" steel plate. Steel-oak-steel construction cushions shocks of rock loading. Free-swinging, kick-out pan adds another tough 3/16" high-manganese steel plate for extra protection. Dumptor also has: rugged main frame, 8" ship-channels, heavily trussed . . . one-piece steel drive-axle housing and transmission case . . . 4" chrome steel drive axles . . . cast alloy steel "I" beam steering axle. All add extra strength to Dumptor chassis.

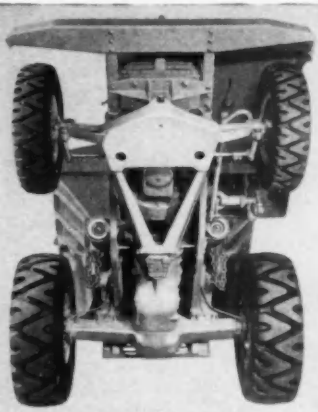
Heavy-duty construction like this assures you that Koehring 6-yard Dumptors will stand up under your toughest assignments . . . that there will be little down time with Dumptors on your job. For complete facts, see your Koehring distributor today.

CK122

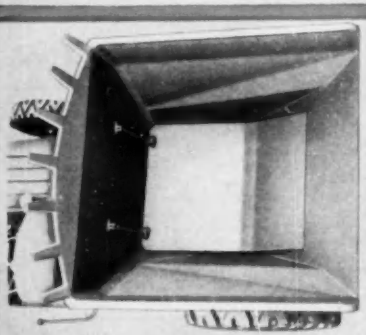
KOEHRING HEAVY DUTY

KOEHRING DUMPTOR®

KOEHRING COMPANY, MILWAUKEE 16, WIS. • SUBSIDIARIES: • KWIK-MIX • PARSONS • JOHNSON



NO "SOFT SPOT" on Dumptor's underside . . . 1-piece, cast steel housing protects drive axle and enclosed chain drive. Wishbone supports the skid plate . . . shields the radius rod and the engine crank case . . . and supports the oscillating steering axle.



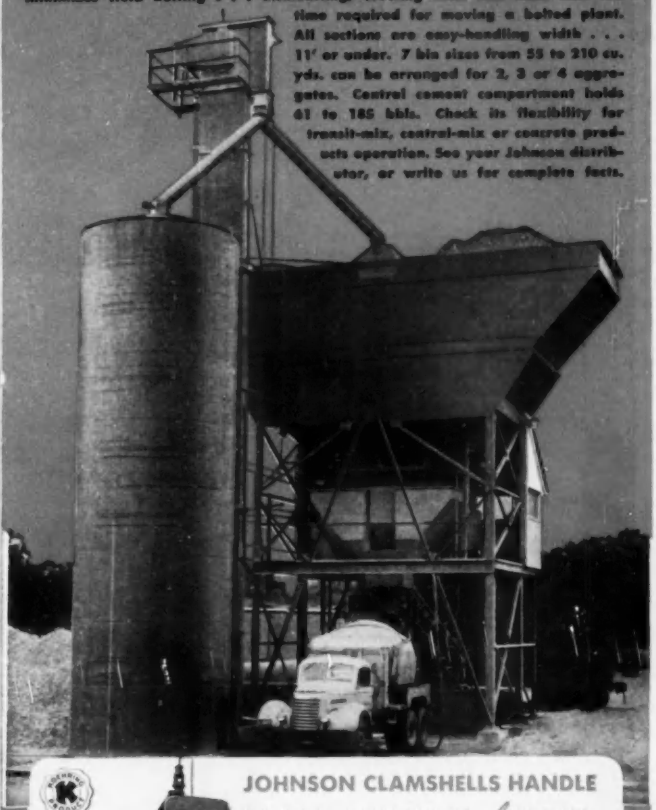
KICK-OUT PAN adds an extra 3/16" high-manganese steel plate on top of sturdy Dumptor bottom . . . breaks suction of sticky materials for fast, clean dump. Big 8' x 8' top gives easy-to-hit target for fast loading over the side or end . . . with less spillage.

1-SECOND GRAVITY DUMP . . . no slow-acting body hoists . . . no body-hoist maintenance . . . plus same speeds forward and reverse for no-turn shuttle hauling keep production yardage high, costs low with Dumptors.

all welded . . . PORTABLE

FOR TRANSIT-MIX • CENTRAL-MIX • CONCRETE PRODUCTS

Quickly moved to reduce haul distance of mixed concrete, Johnson Transit-Mix Plant has all-welded, easily-assembled units. Its portable-section Tandem Bin minimizes field bolting . . . dismantling, erecting take less than half the time required for moving a bolted plant. All sections are easy-handling width . . . 11' or under. 7 bin sizes from 55 to 210 cu. yds. can be arranged for 2, 3 or 4 aggregates. Central cement compartment holds 61 to 185 bbls. Check its flexibility for transit-mix, central-mix or concrete products operation. See your Johnson distributor, or write us for complete facts.



JOHNSON CLAMSHELLS HANDLE EXTRA TONNAGE *because:*

- Large diameter sheaves, with fully sealed needle bearings, reduce friction power loss, deliver full power to cutting lips.
- All-welded construction improves bucket balance, lowers center of gravity, lets teeth dig in straight and deep for capacity load in any material.
- Hard manganese cutting edge, welded to lips, gets tougher with use, assures long life.
- 9 sizes . . . ⅜ to 2½-yard . . . General Purpose, Wide Rehandling and Heavy-Duty Digging types. Write for new catalog.

W12

(Koehring Subsidiary) **C. S. JOHNSON CO.** CHAMPAIGN, ILLINOIS

Take to the air
MT. MORRIS DAM
— 282 feet high
Fourth highest in the eastern United States, located on the Genesee River about 50 miles south of Rochester.
Designed to control the flood waters of the Genesee River which have been known to reach a torrent of 24,000,000 gallons per minute—three times the volume of water hurtling over the American side of Niagara Falls.
Drainage area intercepted—1,077 square miles.
Length of reservoir—17 miles.
Height of spillway above bedrock—216 feet.
Over-all top length of dam—1,003 feet.
CONCRETE DELIVERED BY "AIR EXPRESS" on the Aerial Cableway. This is the cheapest and fastest way to haul the materials needed to build the mammoth dam.

and get it there

Aerial cableway pours a million cubic yards of concrete to build Mt. Morris Dam

● This operation makes you dizzy! If you rode the aerial cableway across the Genesee River, you'd be over 500 feet above the foundations of Mt. Morris Dam, near Rochester, New York.

The main cable or "gut" as it is called, is an American 3-inch Locked Coil Track Strand 1,650 feet long suspended between two towers.

The carriage shuttles back and forth hauling 8 cubic yards of concrete to the dam every 4½ minutes. By the time the dam is finished, more than 1,000,000 cubic yards of concrete will have been poured.

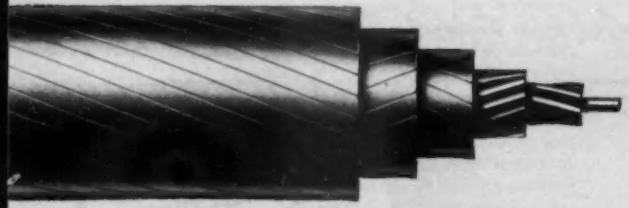
All over this project, American Tiger Brand Wire Rope is doing a stupendous job. It hauls the carriage with a 3,800-foot endless rope. Because of the hard wear this cable must take, they used a 1⅛" 6 x 30 flattened strand rope. This is noted for its superior abrasion resistance.

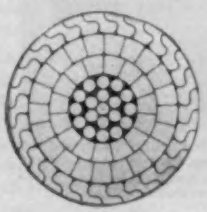
The hoist cable was selected for its strength and resistance to fatigue and wear. This is a ⅞" 6 x 21 Tiger Brand Wire Rope made of improved plow steel.

The "Button" line, and many of the shovel ropes were also Tiger Brand. Some of the Tiger Brand Rope was previously used to help build the giant Shasta Dam. Later it was brought to Mt. Morris and used on shovels and clamshells until it finally wore out. This is the kind of service that has made Tiger Brand the favorite choice of contractors in all parts of the country.

CABLEWAY TOWER—Two of these support the main cable approximately 563 feet above the foundation of the dam. The weight on the "gut" is about 35 tons.

THE "GUT" or main cable—a U·S·S American 3-inch Locked Coil Track Strand 1,650 feet long. Interlocking construction holds each wire in its proper position so that it cannot unravel even if a wire should break.





AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

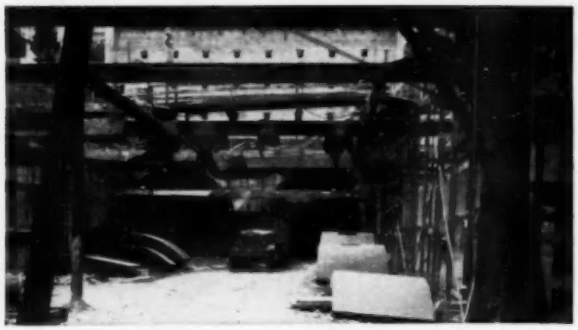
USS TRADE MARK

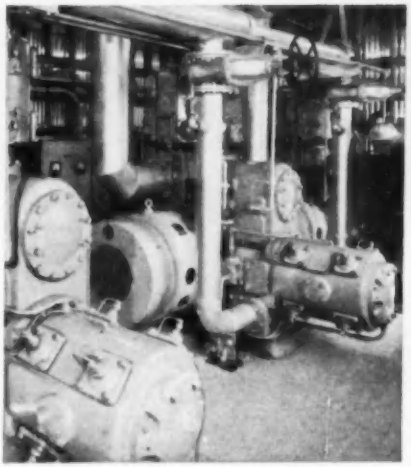
AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

San Francisco's new twin-bore tunnel will be 3400 ft long portal-to-portal with a 1600-ft enclosed bore. Air for the construction tools and equipment is distributed from a central source under 100-lb pressure through 6-in. pipe.





A G-E 150-hp 440-volt, 600-rpm synchronous motor drives each of the three 930-cfm Ingersoll-Rand compressors. Motors and compressors run 24 hours a day five days a week

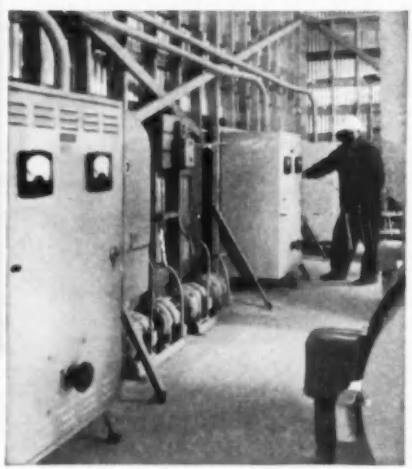
AIR for BOTH
TUNNELER AND TRAVELER
... Electrically

G-E motors and control drive compressors for construction equipment and permanent ventilating blowers at San Francisco's Broadway Tunnel

Compressed air to operate the more than 100 tools, hoists, and muckers being used by the Morrison-Knudsen Construction Co. in work on San Francisco's Broadway tunnel is supplied by centrally located compressors driven by G-E motors and control. Used in place of numerous individual units, the central air supply cuts maintenance costs and adds flexibility to the tunneling operation.

Expressing complete satisfaction with the system, Assistant Project Manager Harry Kirmond reports outstanding performance from G-E drives: *no unscheduled downtime has been charged to the drives up to the halfway mark in the two-year project.* And when the tunnel is complete, G-E equipment will still be on the job in the form of ventilating-equipment drives, and complete distribution facilities for lighting.

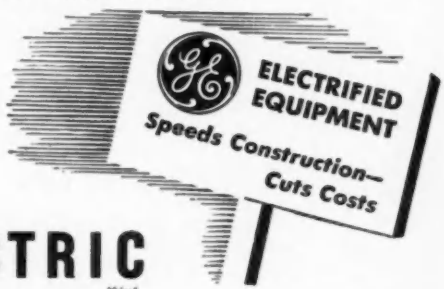
This is another excellent example of the flexibility, speed, and economy that G-E electrification can give you on construction jobs. ***General Electric Company, Schenectady 5, N. Y.***



G-E control for each motor consists of a semi-magnetic starter providing reduced-voltage starting and complete motor protection. G-E motor-generator sets supplying field current are controlled by G-E magnetic starters mounted above them.

Ask him Today!

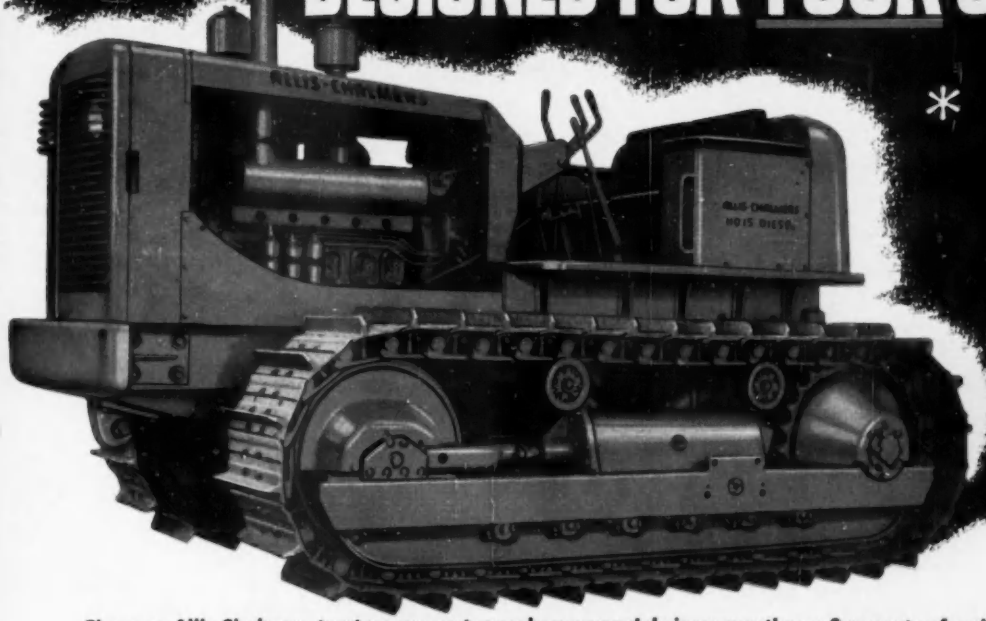
Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.



GENERAL ELECTRIC

Here's what WE mean by

DESIGNED FOR YOUR JOB



The new Allis-Chalmers tractors are not merely new models incorporating refinements of existing ideas . . . they are new from the ground up . . . without compromise anywhere in design or material.

They are the answer to your demands for tractors that will give you outstanding performance on a variety of applications — whatever those jobs may be.

Behind the design are your own ideas . . . and those of your operators and mechanics . . . combined with the vast experience of Allis-Chalmers.

Check the following outstanding features . . . then get the full story from your Allis-Chalmers dealer on this — "THE FINEST TRACTOR LINE ON EARTH."

POWER TO SPARE — A large untapped reserve (up to 1/3 of peak available hp.) assures easier going on toughest work — longer engine life, less servicing. Moreover, it has been proved that General Motors 2-Cycle Diesels are unmatched in lugging ability; they build up torque faster and higher . . . hold it longer.

MATCHED POWER TRAIN ASSEMBLIES — Each and every part of the power train — from master clutch to final drive — has more than enough capacity and strength to handle any load it was ever meant to carry. Bigger clutches, booster steering, double-reduction final drives, all add life—get more work done.

REVOLUTIONARY SHIFT PATTERN — A quick, one-lever shift from any forward speed to any reverse position saves shifting motion and time — smoother and easier, too.

POSITIVE BALANCE — Tractors work equally well with any equipment — drawn or mounted. There's *greater stability* and *traction* with more track on the ground and lower structural weight. Main and truck frames are heavier, truck frames longer . . . idlers are bigger, and both idlers and sprockets lowered . . . all steel construction throughout. Up to 50 percent more ground clearance!

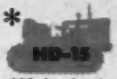
ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

The Newest, Finest Tractor Line on Earth!

40.26 drawbar hp.
11,250 lb.

70 drawbar hp.
18,800 lb.



102 drawbar hp.
27,850 lb.

Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

- **DESIGNED FOR YOUR JOB**
- **BUILT TO "TAKE IT"**
- **EASY TO OPERATE**
- **EASY TO SERVICE**

Excavating Engineer
AUGUST, 1951 • founded 1905

2300 Miles from Pit to Hearth

Major construction and 15 years of preparation preceded the first output from Bethlehem Steel Company's El Pao mine in the Venezuela jungle. The 63-66% hematite now moving by shovel, truck, conveyor, train, barge and ship to Sparrows Point, Md., will shortly reach 3,000,000 + tons per year.

VENEZUELAN iron ore being delivered starting last March to Bethlehem Steel Company's plant at Sparrows Point, Md., marks the fruition of a period of exploration and development which extends over more than fifteen years. When full production is reached, the deposits of Iron Mines Co. of Venezuela, at El Pao, State of Bolivar, is scheduled to yield about three million tons of ore annually. It is also possible, without extensive changes in layout and equipment, to increase the mine production to five million tons a year. The new supply will supplement iron ore shipments from Chile and will help provide the large additional tonnage of ore needed as a result of the current 2,600,000-ton increase in Bethlehem's annual steel-making capacity. The company now has an annual ingot capacity of 16 million tons.

The preparatory work required in bringing this new mine into production included the construction of a river loading station and a deep-water port, and the building of a fleet of shallow-draft vessels, tugs and barges. Three new communities were created in the wilderness, a railroad and a highway have been pushed through the jungle, and several hundred miles of river were sounded, charted, and marked.

Discovered 25 Years Ago

Discovery of the El Pao deposit is credited to a native prospector who, in 1926, found a large outcrop of rich iron ore on the summit of a hill known as El Florero. At that time El Pao was nothing but undeveloped jungle, with a

• Workers' village at Puerto de Hierro, looking toward the Gulf of Paria. Here the 26,000 net ton vessels are loaded with the rich iron ore for trans-shipment to United States. In background are pier, conveyors and ore bridge. Natives with machettes cut a path through the jungle to hill from which picture was taken. *All photos courtesy Bethlehem Steel Company.*

few scattered huts. It lay about 30 miles south of San Felix, a village of around five hundred population situated near the confluence of the Caroni and Orinoco Rivers.

After some preliminary exploratory work, Bethlehem Steel Co. acquired the concessions in 1933 and organized the Iron Mines Co. of Venezuela to develop and operate them. At first 22 concessions were acquired. Six of these were later relinquished, leaving a total of 16 concessions covering an area of nearly 20,000 acres.

A general survey of the property was started in 1937. This included exploration and mapping, preparation of engineering plans and general layouts for camps, shops, a railroad and a highway between the mine and the present port of Palua on the Orinoco River.

A plan was adopted which involved shipping of the ore by rail from the mine at El Pao to Palua, for storage or loading into shallow draft barges. These carry the ore down river 230 miles to the deep water port of Puerto de Hierro. Here the ore is transferred to the stock pile for loading into specially designed ore hauling vessels for shipment to the United States.

Construction Slowed by War

Construction work began in February 1941; however, lack of personnel and materials brought the work to a virtual standstill during and immediately following the war years. Without this interruption, the work would probably have been finished in five years instead of taking nearly ten.

In February 1947, the company acquired two properties on the Gulf of Paria, known as the Valley of Jamaica and the Valley of Carenero, to be used as site for a transfer station appropriately named Puerto de Hierro, or "Iron Port." Construction here was started in May of the same year and completed in July 1950.

The first major step in the building program was the establishment of a construction camp at Palua, with docking accommodations for vessels bringing in machinery and supplies, and adequate warehouse and storage facilities. A 50-ton stiff-leg derrick was erected on the river bank, for use in unloading cargo.

With the completion of a 30-mile two-lane gravel road from Palua to El Pao, early in 1944, work on the mining camp could proceed. Construction of the single-track railroad to the mine was also started at the same time, and the last spike was driven on June 1, 1950.

The total length of the railroad is 38.7 miles, of which 34.8 miles is main-line track. It climbs about 1,600 feet as it winds its way up to the mine. Of the total trackage, 21 miles is curved and super elevated; maximum curve is 11° and maximum grade 2%, compensated for curvature. There are six short-span steel-girder bridges, five arch culverts and 12 box culverts. Five sidings are provided for passing.

Over 1,500,000 yards of earth and rock had to be moved in the construction of the railroad. Two quarries with a crushing plant were opened, one at each end, to supply granite ballast for the road bed. Imported creosoted pine ties were found to be the most economical and satisfactory for service in the tropics. The track is U. S. standard gauge, with 100-lb. rails.

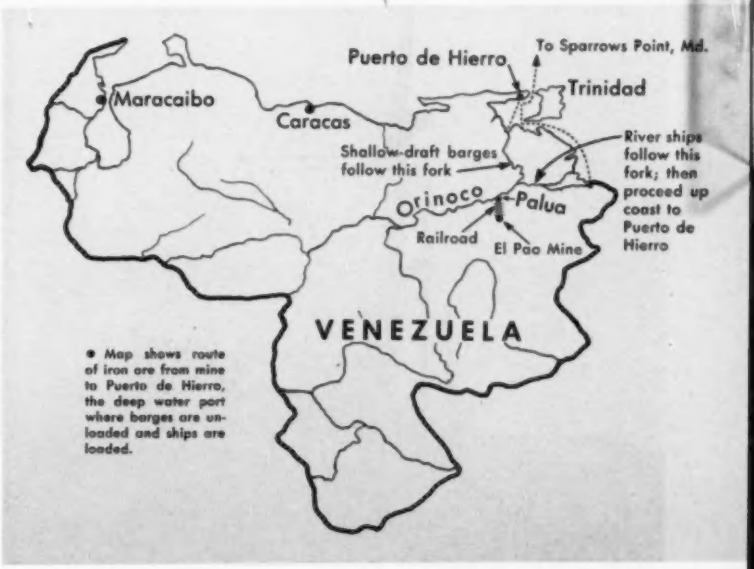
The main-line haulage equipment consists of three 130-ton, 1,500-hp diesel-electric locomotives with dynamic braking; a hundred 70-ton bottom-dump ore cars and miscellaneous flat cars, box cars, and tank cars.

The ore is a hard, massive hematite which will range from 63 to 66% iron, as shipped. It is of a type that may be used either in blast furnaces, or open hearths. The main deposit now being mined is a bowl-shaped formation about 2,600 feet long and 1,700 feet wide, on top of a hill rising several hundred feet above the surrounding country. The center of the bowl-like formation is filled with an overburden consisting mainly of clay, but with some igneous material; this ranges up to 425 feet in thickness and must be stripped before the ore body can be mined out. The ore body itself varies from a few feet to approximately 400 feet in thickness.

There are other exposed ore bodies within the concessions which will be mined later, but sufficient exploration drilling has not yet been completed to determine their size.

Open Pit Mining Used

The mining method adopted is one of slicing off the top of the hill in 43-ft. high benches by standard open-pit methods. Eventually, due to the shape of the ore body, a pit will be excavated within the hill. Actual mining operations were started in August 1950 and are now being carried out on the two upper benches where the ore is exposed at the surface, with no overburden to remove. The program for the stripping of overburden will begin shortly and will progress with the min-



• Map shows route of iron ore from mine to Puerto de Hierro, the deep water port where barges are unloaded and ships are loaded.

ing of the various levels. Present estimates indicate that one cubic yard of overburden will have to be removed for every 4.2 tons of ore mined.

Primary drilling in the ore is done with crawler-mounted electric churn drills putting down 9-in. holes. The upper portion of the ore body now being mined is badly fractured, a condition which, combined with the extreme hardness of the ore, presents a very difficult drilling problem.

Secondary drilling is presently being done with pneumatic wagon drills and jack hammers with "one use" and tungsten carbide insert detachable bits. A steel drop ball will also be used for secondary breakage where practicable.

At present all blasting is done with 60% straight gelatin dynamite detonated with instantaneous detonating fuse and electric blasting caps. Other types of explosives are being tried out to determine the type most economical and efficient under prevailing conditions.

Ore and overburden are handled by four electric shovels with 4-yd. dippers and Ward Leonard control. The ore is loaded into ten 30-ton, side-dump semi-trailers hauled by 200-hp diesel-engine powered tractor trucks. The heavily loaded trucks travel about one mile down an 8% grade to the crushing plant. A special hydraulic retarding unit supplements the regular brakes on the down-hill haul. The trucks are dumped at the crusher by a fixed overhead crane which permits control of the rate of feed to the crusher.

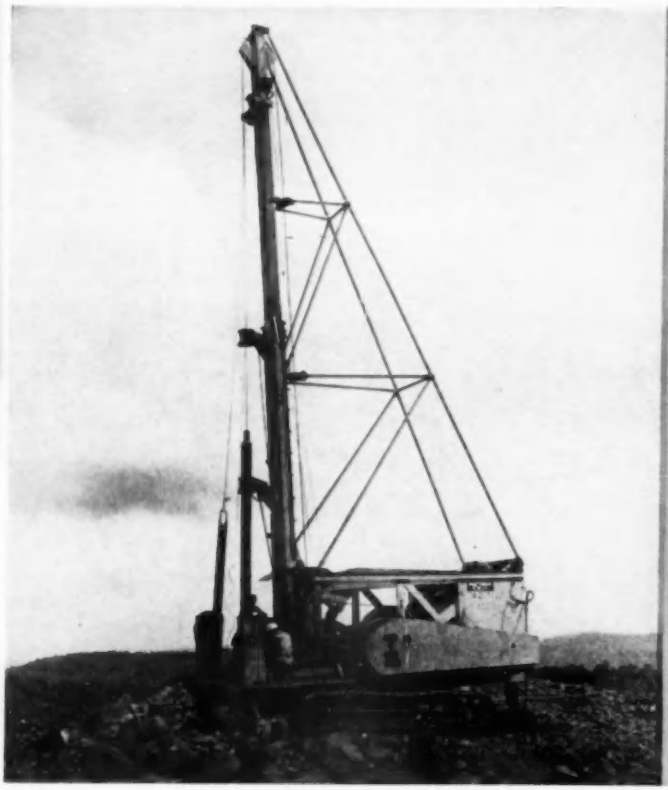
Primary crushing is done in a 54 x 84-in. Blake-type jaw crusher powered by a 350-hp electric motor through V-belt drive. Set to crush to six inches, the crusher has a capacity of 900 tons of ore per hour.

The jaw crusher discharges directly onto a 42-in. rubber belt conveyor, 179 feet long, running at 370 fpm and delivering the ore to a 2⅜-in. grizzly at the secondary crushers. Oversize from the grizzly flows into two 5 ft. 6 in. gyratory crushers, each with a capacity of 440 tons per hour and set to crush to 2½ inches, or by-passes the gyratories as open-hearth lump.

Gyratory discharge and the undersize from the grizzly are combined on a 42-in. belt conveyor, 426 feet long, running at 370 fpm and discharging onto a 2⅜-in. grizzly on top of the ore-loading bin at the rail head. This bin, a large steel structure, has a capacity of 4,000 tons and is divided into three compartments to permit separate handling of blast furnace ore and open hearth lump ore.

Ore is drawn from the bottom of the bin through six air-cylinder operated gates into railroad cars on a double track under the bin. A 70-ton car can be loaded in about one minute.

Normally a train is made up of 30 to 33 cars, drawn by one locomotive, with 36 cars the maximum. With an annual production of three million tons of ore, four trains will be run from the mine to Palua every working day. Due to the steep down-grades the heavily



● Left: Crawler-mounted electric churn drills sink 9-in. holes for blasting. Secondary drilling is handled by wagon drills and jackhammers. Above: One of four 4-yd. electric shovels which dig both ore and overburden.

loaded trains must travel at moderate speed, negotiating the trip to Palua in a little over two hours.

River Installation

At the river port of Palua the loaded trains are run onto a plate-girder steel trestle over a 550-foot long, 43-foot deep pocket excavated in the solid rock. The bottom-dump cars discharge ore into the pocket which has a live storage capacity of 27,500 tons with an extra 16,500 tons dead-storage capacity.

An additional 800,000 tons of ore can be stocked under a 13-ton ore bridge which overhangs the ore pocket and operates on tracks parallel with it. The bridge has a span of 320 feet and 146-ft. and 95-ft. cantilevers.

Underneath the storage pocket is a 660-ft. reinforced-concrete tunnel with twenty 4x4 ft. air-operated chute gates in the roof, through which the ore is drawn from the pocket through three roll-type feeders and delivered to a 48-in. rubber belt conveyor, 617 feet long, which travels through the tunnel at a speed of 450 fpm.

To prevent surges of ore from flooding the belt, the feeders are interlocked with the gate mechanism by electric relays in such a manner that it is impossible to open a gate unless a feeder is in the correct position underneath, with the drum revolving.

The tunnel conveyor discharges the ore to a second 48-in. belt, 537 feet long, built at right angle to the ore pocket. Conveyor No. 2 travels at 450 fpm onto a 416-ft. long steel loading structure which cantilevers out over the Orinoco River.

Directly underneath the second conveyor, and parallel with it, is a 141-ft. long 48-in. shuttle conveyor, operating at 455 fpm, which discharges the ore through a telescoping steel chute directly into the vessels moored below. This conveyor has a travel of 64 feet, sufficient for proper trimming of the vessels being loaded, especially important due to their shallow draft.

This method of loading was made necessary by the large seasonal variation in the water level of the Orinoco River, nearly 43 feet at Palua, which makes it impracticable to load the vessels from an ordinary wharf.

Five 4,500-ton barges with 14-ft. loaded draft and one twin-screw river vessel of 8,500-ton capacity at maximum draft, the "Punta Aramaya," are used to transport the ore from Palua to tidewater. A second river vessel, the "Punta Morocoto," will be in service this year and a third vessel has been authorized.

To provide a mooring platform with the necessary equipment for shifting the vessels during loading, a floating dock has been developed. This dock is 480 feet long and is made up from six articulated 80 x 20-ft. sections pinned together. Each section is constructed of 24-in. wide-flange beams and floats on four steel pontoons, 20 x 7½ feet, 4½ feet deep, any of which may be removed for maintenance and replaced without interfer-

• Right: Fleet of ten 30-ton side dump trailers pulled by Diesel trucks carries ore one mile to crushing plant. Dumper controls feed to Blake-type jaw crusher handling 900 tons of ore per hour at a 6-in. setting.

• Diesel-electric power station at El Pao. In addition to three 980-kw generators shown, the station has one 250-kw and one 66-kw unit.

ence with the operation of the dock.

The dock is held in position by six anchor chains. In order to provide sufficient depth of water over the chains, these are fastened a considerable distance back of the fender line to anchor sections pinned to the dock. A chain to the shore at each end and two diagonal chains for securing the dock longitudinally complete the anchorages. The river anchors were dragged and the chain prestressed to a 50-ton pull, adjusted to proper position, and fastened permanently to the dock.

This arrangement gives the dock full freedom to move up and down with the rise and fall of the river. It is remarkably stable, requires no adjustment, has excellent shock-absorbing properties, is inexpensive to construct, and may be painted and maintained without interruption in service.

The barges, which operate only during the season of high water, from April to November, are towed to Puerto de Hierro by 1,300-hp ocean-going tugs, the "Patao" and the "Capure." They travel via Cano Manamo past Pedernales and across the Gulf of Paria, a distance of 230 miles.

Use Alternate Routes

Due to their greater draft, the "Punta Aramaya" and her sister ships must travel the 395-mile route through the main channel of the Orinoco—the Boca Grande—and up the coast. During the season of high water, they may return empty to Palua by the shorter Pedernales route.

Normally the barges will make the round trip in three days, as will the larger vessels when they can use the shorter route back to Palua.

Both branches of the river were surveyed and sounded and over a hundred beacons and buoys were placed as aids to navigation.

Large Installations at Tidewater

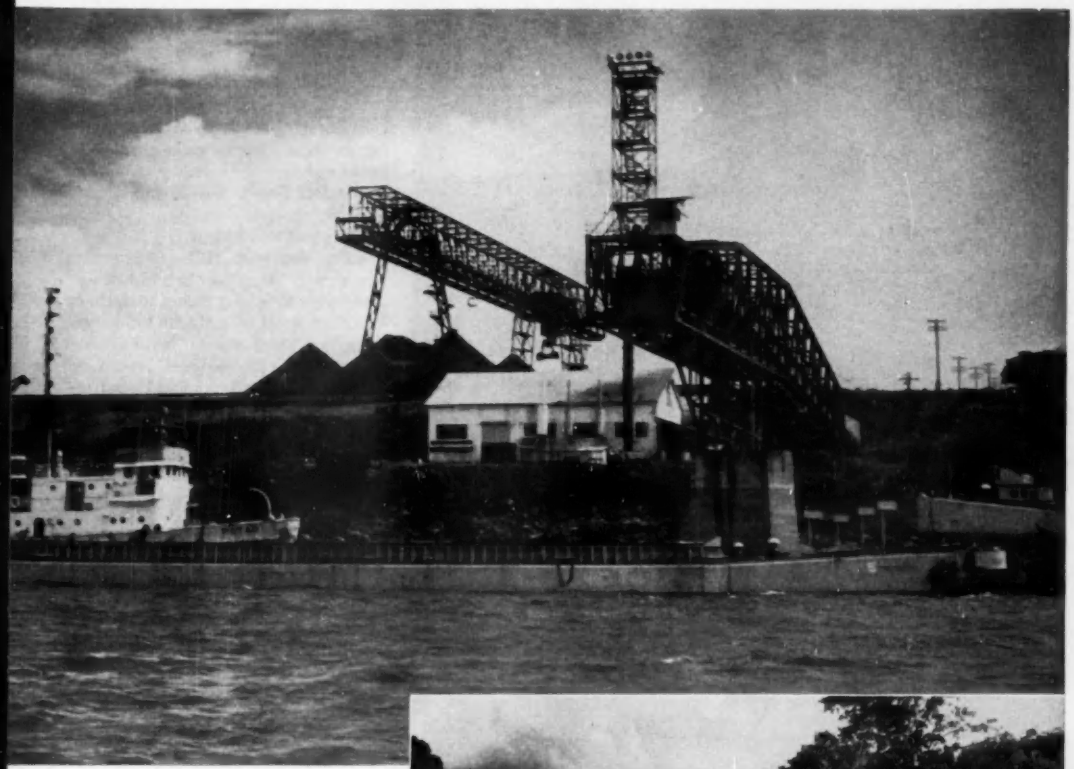
Puerto de Hierro was selected as deep water port because it afforded a suitable location for docking and loading the 26,000 net ton ore carriers, with adequate space for ore storage and the extensive shore installations required.

Due to foundation conditions, it was decided to locate the heavy stock pile far enough inland to guarantee stability. Such an arrangement required a pier where barges and river vessels could be unloaded and where ocean-going vessels could be loaded at the same time if necessary.

A flexible type pier of steel construction, resting on steel H-piles, was found best suited for supporting the heavy, concentrated loads of the loading and unloading towers.

Ground borings showed a sand bottom under the mud in the bay, and load tests on piling indicated that loads in excess of 100 tons per pile could be adopted in the pier design. Before pier construction was started, the bay was dredged to a maximum depth of 42 feet below low water.

The main pier structure and ramp is 785 feet long and 80 feet wide, and is supported on 239 14BP 102-lb. steel H piles. The superstructure consists of heavy steel framing welded to the piles and a deck of continuous reinforced concrete integral with the steel framing. This makes the whole pier



• Above: Tug and loaded barge at Palua, on the Orinoco River. Steel structure extending over river is cantilever for belt conveyor which loads barges. Under background ore bridge is storage space for 800,000 tons of ore. Right: Ore train leaves El Pao mine for Palua shown in upper photo. Thirty to thirty-three 70-ton cars make up a train.

act as a monolithic structure combining great strength and flexibility.

A 150-ft. approach of similar construction provides two truck lanes for access to the pier. Three 30-ft. diameter circular dolphins made of steel sheet piling keep the ships in proper channel and protect the pier from head-on impact.

Barges and river steamers are placed end to end along the west side of the pier and unloaded by three travelling rope unloading towers with 8-ton clamshell buckets. The towers, which have an average combined capacity of about 1,200 tph discharge the ore onto a 48-in. rubber belt, totaling 1,852 feet in length, in two flights, and travelling at 500 fpm. The conveyor leads from the pier over a trestle where the ore is discharged by a travelling-boom

● Barge of iron ore is unloaded at the pier, Puerto de Hierro. Three unloaders equipped with 8-ton clamshells transfer ore to belt conveyor which carries it to storage piles.

tripper onto a storage pile over a loading conveyor tunnel. The storage pile has 80,000 tons live capacity. An additional 1,200,000 tons may be stocked in an adjacent area under a 13-ton ore bridge with 320-ft. span.

Mayari R high-strength steel was used in the construction of the unloaders, in order to decrease their weight. The high corrosion resistance of this steel was also a contributing factor in its selection. Each tower weighs approximately 400 tons.

Ore is drawn from storage into a 710-ft. long concrete tunnel, similar to that at Palua, through 18 chute gates. Three roll feeders place the ore on a 992-ft., 48-in. belt traveling at 500 fpm, and discharging onto a 48-in. pier loading conveyor, 811 feet long. This passes through a traveling-boom tower which loads the ore into the holds of the ocean-going ore vessels berthed on the east side of the pier.

It requires about 10 hours to load the 26,000 net-ton vessels which make the 1950-mile journey to Sparrows Point, and back, in about 13 days.

Power Supply

Electric power for El Pao, Palua and Puerto de Hierro is generated at 2,400 volts and 60 cycles in three separate Diesel-electric power stations. The El Pao station has three 980-kw generators and two smaller units of 250-kw and 66-kw capacity, respectively. Palua has three 250-kw and one 66-kw generators, as well as a 500-kw DC generator which supplies power for the ore bridge. Four 980-kw generators, supplemented by a 250-kw and a 66-kw unit produce power at Puerto de Hierro. DC power for the ore bridge is supplied by an ignetron rectifier. Electric power for lighting and similar uses is supplied by suitable transformers.

Compressed air for the mine is produced in two 1,400 cfm Diesel engine driven compressors.

Modern Housing for Employees

During the peak of construction the company had nearly 1,600 men working in three camps, while about 800 additional were employed by an outside contractor. Today, with all major construction projects completed, the force has dropped to a little over 1,000 men.

Palua, the oldest of the settlements, has already taken on the finished appearance which only comes with time. The main street is lined with full-grown trees, and yards abound in shrubbery and flowers. El Pao and Puerto de Hierro still have a new look, but efforts to make them home-like and attractive are in evidence everywhere.

Two family houses are provided for workmen, and single dwellings for foremen, office workers and the staff. Practically all houses are one-story, of a construction adapted to the tropical climate—cool, fully screened, and termite proof. All have electric light, modern plumbing, and sewer connection. The villages are laid out with wide, well-lighted, hard-surfaced streets.

Attractive schools with light, cheerful classrooms and sanitary washrooms have been built in all villages. The company pays all expenses of maintaining the schools, including teachers' salaries and books and supplies. Appointment of teachers and all administration, however, are functions of the Venezuelan government.

Clean, sanitary commissaries are operated in all communities. These have walk-in refrigerated storage boxes for meat, fruit and vegetables, and are well stocked with groceries, shoes, and dry goods. Space is also made available for native merchants in the villages.

Free Medical Service

Medical service and hospitalization are free to all employees and their families. A hospital with 24 beds for the mine and river port is maintained at Palua, and a 14-bed hospital at Puerto de Hierro. Both have well-equipped operating rooms and modern X-ray and therapeutic facilities, and all types of serum and vaccines are kept on hand. Two doctors, with a staff of nurses are in attendance at each place. A 24-bed hospital is under construction at El Pao.

Communication with the outside

Continued on page 54

Shovel Handles Logs With Special Tongs

By W. J. Granberg

POWER shovels are taking to the woods in the Pacific Northwest —loading logs in a safe, efficient and economical manner with a new air-actuated front end attachment.

The device is an air-tong which enables the shovel to pick up the huge sticks and place them gently on a truck. The loading unit consists of two curved tong legs, individually pinned on a rigid frame, air compressor, hose and air tank. Above the pivot-pin points of the tong legs a double-acting air cylinder is secured to one leg and the piston rod connected to the other. At the lower end of both legs are three sharp spurs for gripping the log.

When air is applied, the tong legs encircle the logs and close. When the dipper stick is raised, the weight of the log causes the tong spurs to dig into it and hold the legs closed with a minimum of air pressure in the cylinder. As the stick of timber is lifted, it is heeled either against a sawtooth plate installed a short distance behind the tong legs, or, as in the case of larger logs, rests against the dipper stick, or shovel boom.

With the shovel free to swing in any direction, the dipper stick is extended or retracted to place the log on a truck. Conducted by the shovel operator in the cab, the loading process is entirely mechanical, with no outside manual labor involved. This fact underlines the safety element in the operation, which is perhaps the outstanding achievement of the air-tong loader.

One of the most recent installations of the loader was on a Bucyrus-Erie 38-B shovel for the Weyerhaeuser Timber Co. in its logging operation at Springfield, Ore.

Logs up to 58 inches may be handled by the tong which is made in three sizes for shovels of ½-yd. to 2-yd. capacity. The smallest unit takes logs 30 to 36 inches in diameter, the second ranges in capacity from 40 to 42 inches, and the third from 50 to 58 inches.

The air-tong loader, invented by Lew Rees, logging superintendent for Crown Zellerbach Corp. and manufactured by Berger Engineering Works, Inc., Seattle, Wash., is proving especially valuable in pre-logging, salvage logging and in small timber. The air compressor utilized is a 330 Quincy with a 275-lb. tank.

The loading unit may be installed on existing dipper sticks, or acquired complete with dipper stick, or on a loading boom. In recent installations the spurs have been eliminated and a hydraulic locking cylinder added to lock the smooth tongs around the logs, making release of the timber easier.

From Park to Parking Garage

by Robert J. Green

IN THE heart of Los Angeles, where citizens once relaxed or debated during leisure hours, Pershing Square is a bedlam of construction. Gone are the walks, trees, and benches. In their place is a modern excavation scene: power shovels, trucks and drill rigs. A year from now the trees and walks and benches will be back in Pershing Square, but underneath the ground men will have built one of the largest parking garage and emergency disaster shelters yet devised.

Approximately $5 million of private capital is invested in the Pershing Square venture, which when completed will store 2,000 automobiles in the very heart of the city. A syndicate known as City Park Garage, Inc. is controlling the work, which is being designed by Stiles Clements, Associated Architects and Engineers. Contractors on the big project include several joint-venture firms: Ford J. Twaits Co., Morrison-Knudsen Company, Inc., and T-S Construction Engineers, Inc. The Los Angeles firm of C. G. Willis & Sons has one of the main sub-contracts, calling for removal of about 250,000 yards of excavation. When that work is completed, the Pershing Square site will be a 30-ft. deep hole in the ground 350 feet wide by 600 feet long.

History of Pershing Square

Pershing Square and its surrounding street areas once belonged to the California Indians and the King of Spain, and is presently owned by the City of Los Angeles. The property has never belonged to anyone else, historical records show.

In the early days of the padres, Pershing Square was swampy. It was covered with a natural growth of trees and grass, and was used regularly as a camping spot for traveling groups going through from San Diego to San Francisco, or between closer points surrounding the Los Angeles Pueblo. Historians believe it was this natural "park" condition which kept the Pueblo government from selling the spot, and made it possible to keep it in the possession of the present government as a public place.

In a technical sense, Pershing Square has never been a park, although it has served that purpose. It has never been dedicated for park purposes. Its dedication for the enjoyment of citizens closely parallels the historical Massachusetts Commons.

Vote on Charter Amendment

Los Angeles attorneys, while they believed the city had every right to lease the underground rights for garage purposes, felt that financing concerns would ask for more specific rights before they loaned large sums of money on the project. Consequently, a Charter Amendment was offered to the Los Angeles voters in April, 1947, which covered the situation. It was carried by a two to one vote, with the understanding that it was the intention to lease the site for a garage.

That action climaxed effort in that direction which has been carried on for years. Back in 1928, local property owners and businessmen were making the first attempt to convert this ideal location into a parking center. In 1931 and 1932 three different groups of people worked on plans for such a garage. None seemed to be satisfactory. The entire conception of the project always indicated the desirability of some plan where the city would either build and operate the garage itself, or would lease the property to private parties for such construction and operation.

Location is Ideal

In 1945, the Downtown Business Men's Association started studies which now are culminating in the roar of power shovels. The studies of this group, which have been kept up to date through cooperation with City Engi-

Los Angeles' Pershing Square is being converted by contract to a modern underground garage and disaster shelter. Joint venturers will restore the historic park after completing $5 million structure.

• Picture from corner of Fifth and Hill Streets shows Pershing Square as it was. Restoration of the square's surface following completion of the underground garage will change appearance of familiar downtown park.

neer Ralph Dorsey, showed that Pershing Square was in the right location to serve a great number of people and institutions in the downtown area with convenient parking. Then a second economic and engineering study by the association and the Ramp Buildings Corporation was made. The general desirability of the project, a close estimate of its cost, and an estimate of business that might be done if it was built were included in this report.

Officially, the project has always been designated as a garage, and no mention has officially been made that the underground Pershing Square facilities might—in case of a hostile air attack—be used as a disaster shelter. But there is little doubt that the outbreak of Korean hostilities last summer helped to spur the project from planning to the construction stage.

Financial Background

The financial history of the project is long and involved. Financial backing by private capital was so lacking in October, 1949, when the project was first advertised, that no bids were received. Several persons who had indicated a desire to bid asked for a time extension. The extension was granted, but no further bids were received and for a time it appeared that the Los Angeles Department of Recreation and Parks would drop the whole matter on the ground there was not sufficient interest to justify the readvertising of the job.

However, at the Downtown Business Men's Association's urgent request and written statements from several concerns that they would bid if given another opportunity, bids were again called for. The prospective bidders, all of whom were having difficulties in making their final arrangements for financing, were unable again to bid. A 6-week extension was again made and the single bid by the City Park Garage, Inc. was received. This firm was organized by Ford J. Twaits, Morrison-Knudsen Company, Inc., and Stiles Clements.

Direct financing was accomplished by a first mortgage loan from the Equitable Life Assurance Society, a second debenture mortgage bond sale to local business interests, and the purchase of common stock by the City Park Garage syndicate. A total of $250-000 of second debenture bonds were purchased by downtown business and property owners after the Downtown Business Men's Association had carried on a whirlwind 10-day campaign.

• Biltmore Hotel landmark overlooks early-stage excavation. Shovels have taken down first of two 15-ft. benches.

Biggest in the World

Designed for a capacity of 2,000 cars with three floors, the Pershing Square structure will be the largest underground garage in the world. From a traffic standpoint, it will be unusually fast and safe. All automobile ramps leading in and out of the garage will pass under the sidewalks, thus avoiding any possibility of collision between automobiles and pedestrians. All exterior ramps leading into the garage are nearly one full block in length, providing exceptional storage capacity for automobiles waiting to enter, thus taking them off the streets.

Interior ramps are circular in design, and ramp models show that automobiles will be able to move at a good rate of speed. The ramps are equipped with center dividers to separate up from down traffic.

All car movements in and out of the garage must move in line with existing street traffic. This will make the least possible amount of interference with other traffic, and get away from

• An artist's conception of one entrance to the completed sub-surface garage. Set-in walks will allow entrances on all four sides.

● Left: A truck-mounted winch with A-frame loads potted and wrapped shrubs onto a 20th Century Fox truck. The shrubs will be transplanted until needed again. Tree below was too big to store and Caterpillar D8 bulldozer felled it.

the problem of dumping traffic out into the street at right angles to the direction of flow. Persons using the garage will be provided with escalators. The garage will have rest rooms, full facilities for automobile service, fresh air blowers to change the air at least once every six minutes, and a parking scheme so efficient that the structure can be emptied completely in 27 minutes.

The garage location is surrounded by four excellent streets: Fifth and Sixth running east and west, and Hill and Olive running north and south. Fifth and Sixth are one-way streets. All four thoroughfares connect directly, or nearly so, to important freeways now under construction.

Excavation a Major Feature

By its very nature, the underground facility calls for an excavation job of more than usual importance. Not only is almost a quarter of a million yards of excavation involved, but in addition the topsoil must be saved for use later on when the park area is reconstructed.

When the first machines came in to start the work, Pershing Square had pedestrian walks, statues, trees and shrubs in profusion, and it was a veritable haven for doves, pigeons and other birds. Plans of the park department included the re-use of many of the trees and shrubs, so arrangements were made with horticultural and landscape experts of 20th Century Fox studios to salvage many such trees and shrubs. They were carefully dug out, the roots with dirt intact were wrapped in burlap, and they were then loaded by a truck-mounted winch and carted away. Most of the trees have been transplanted temporarily, and will be hauled back and replanted when the garage is finished and the topsoil is replaced.

Trees too large or too old to salvage were dozed down, stacked, and hauled away. A Caterpillar D8-mounted dozer was the first machine on the job, and its first pass with Los Angeles Mayor Fletcher Bowron and Contractor Ford Twaits aboard officially dedicated the commencement of construction. The tractor then worked about two weeks pushing over the remaining palm and gum trees, ripping up the pedestrian walks, and generally clearing the 350 x 600 ft. area.

While this was under way, downtown Los Angeles sidewalk superintendents had a field day. The high board fence which later was put up to surround the area had not been erected, and the movement of machines inside the Pershing Square enclosure drew thousands of spectators. The doves and other birds, which for generations had nested in Pershing Square trees, were as confused as the spectators were curious. Some of the birds found a sanctuary in MacArthur Park, about one-quarter of a mile away, but even after the site was scarcely more than a hole in the ground the birds returned again and again, stopping on light standards and even on equipment.

Removal Methods

Heavy excavation operations by day would overload the already heavy traffic on Los Angeles streets, so C. G. Willis & Sons, Inc. elected to move the dirt between 6 PM and 2 AM, after the peak evening traffic rush. This schedule is currently being followed, five days a week.

The excavation scheme consists of a

● A Bucyrus-Erie 38-B crane unloads 8-ton concrete A-sections which will prevent slides during excavation and later become part of foundation.

2-pass operation, each pass removing a 15-ft. bench of dirt. A permanent ramp for entrance and exit of hauling units is located near the center of the area on the Hill Street, or east, boundary. Excavating equipment is first removing the two 15-ft. deep blocks over the south half of the area. With the grade uncovered over that area, footing excavation and the first concrete work can proceed while excavating equipment then removes the north half of the Pershing Square area.

Because of a 4-mile haul from Pershing Square to the Chavez Ravine disposal area, and especially because the haul road lay over city streets, conditions indicated a truck and shovel digging operation. Willis is using two shovels for the main excavation. They are a P&H Model 655-A, equipped with a 1½-yd. Esco dipper, and a Koehring 801 with a 2½-yd. Esco dipper. An average of 45 rented hauling trucks is used per shift. They consist of Fords, GMC's, Chevrolets, Dodges and Internationals. Willis recently purchased three new International KB-8's, and they, too, are in the string.

All the trucks have one thing in common: they have dump bodies which will haul 7¼ bank yards of material. The shovels stay far enough apart to permit double spotting under each machine with a minimum of interference from truck traffic. They load by taking a full cut up the 15-ft. bank, and swing not more than 90° to get over the trucks. The material is typical of the ancient alluvial fan between the southern California mountains and the sea. It consists of sand, clay, small boulders, and pockets of silt. No solid rock is likely to be encountered, and the entire south half has been dug without finding any really hard material, or any ground water.

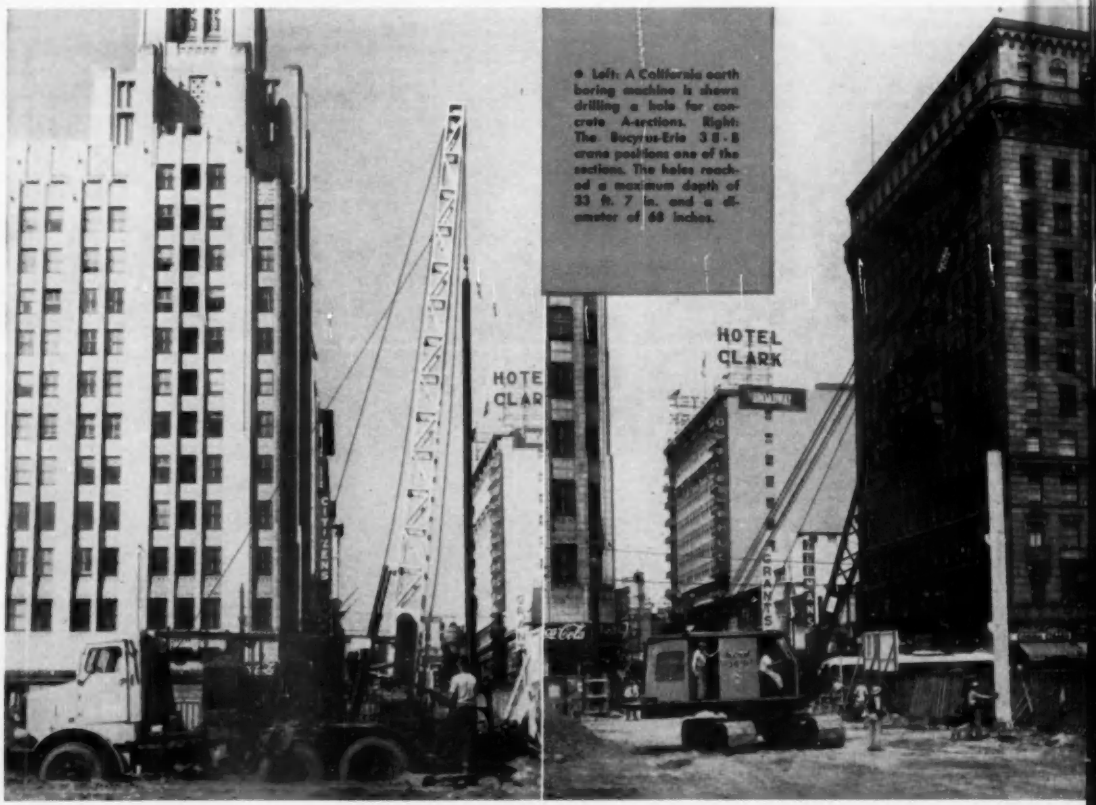
Movement is Fast

A steady flow of from 520 to 580 loads rolls out of Pershing Square every working night. Figured at 7¼ yards bank measure, this means that the two shovels are loading about 4,000 yards a shift. Strangely, no traffic policeman has been necessary so far. The fence along Fifth Street extends out slightly into Hill Street, and automobiles invariably turn instead of coming up Hill Street. This permits loaded trucks to come out the exit, make the left turn into Hill Street with a minimum of delay, and continue to the dump ground.

The ramp and haul roads inside the excavation area are regularly bladed by the D8-mounted dozer, which also cleans up around the shovels and makes minor adjustments to the grade when necessary.

Footings for the garage columns are being excavated by a ¾-yd. 22-B Bucyrus-Erie dragshovel, working after the main floor grade has been established by the larger machines. The dipper on this machine is part of the standard Bucyrus-Erie equipment which came with the rig. On all three excavating rigs, dipper teeth are partly Esco and partly H&L. The material is not very abrasive, however, and a set of teeth lasts many weeks.

Equipment upkeep consists of routine mobile field service. Fuel trucks service the machines direct. Most of the rented trucks have their own fuel arrangements. An oiler on each shovel



● Left: A California earth boring machine is shown drilling a hole for concrete A-sections. Right: The Bucyrus-Erie 38-B crane positions one of the sections. The holes reached a maximum depth of 33 ft. 7 in. and a diameter of 60 inches.

• Top left: M. M. Mayer, (left) vice president of C. O. Willis & Sons, gives Excavation Supt. Howard Winsett his nightly orders. Close supervision is necessary on project because of location and traffic danger.

• Top right: Rain in Los Angeles . . . but it does happen once in a while. This No. 12 Caterpillar motor grader quickly cut a drainage ditch to get the water off the haul road the trucks must use at night.

• Center right: A-sections show up as workmen expose their tops. These concrete sections, which will become a part of the permanent building, are set in place in drilled holes to hold banks from caving.

• Center left: Here's how 30-ft. hole was taken out in two benches. P & H 655-A shovel with a 1½-yd. Esco dipper and a Koehring 801 with 2½-yd. Esco dipper are shown at work in early evening. On the far side of the hole are a few of the special A-sections.

• Bottom: It is nearly midnight, and lights from the two shovels glow through darkness as two trucks get loads of dirt.

● General view of excavation at grade level shows the 38-B unloading a fuel tank while in the background the 22-B digs footings, the 08 does clean-up, and three drill rigs continue their work.

keeps it lubricated, and both the operator and oiler usually start working an hour before digging starts, so the machines will carry on through each shift without down time for service.

Unusual Side Design

Excavation work is tied in very closely with some unusual engineering design for the sides of the building. Obviously if Pershing Square were excavated 30 feet deep with vertical sides to the hole, there would be extreme danger of caving of adjacent sidewalks, and perhaps even movement of buildings. This danger has been eliminated by a method which actually builds the sides of the garage ahead of excavation.

The method consists of placing 8-ton reinforced concrete pedestal A-sections, as tall as the garage, which rest on 9-ft. centers in special holes drilled to receive them. After these heavy sections are in place around the entire perimeter, their weight is sufficient to hold the bank from caving, although if necessary temporary lateral bracing can be placed between the A-sections and the main garage structure. Original excavation leaves a substantial block of earth in place, sloped down on an .8 to 1 angle to grade. After the garage is built, this remaining block of earth is to be scooped away by a 1½-yd. Bucyrus-Erie 38-B dragshovel, working from a position inside the building. Original plans called for a series of precast concrete slabs to be lowered into grooves in the A-sections, but it now appears that the 38-B will control its cut so precisely, and the banks will stand up so well, that gunite protection can be used instead. The A-sections and walls will then become a part of the garage itself.

Casey and Case Foundation Co. of Los Angeles have the drilling sub-contract for the A-section holes. This company is using four California earth boring machines, specially built by California Welding and Blacksmith Co. The largest of the four rigs will bore a 36-in. hole 50 feet deep without trouble. Mounted on an International truck, it consists of a Hercules gasoline engine for main drill power, a small American hoist for raising and lowering the rotary drilling tool, a drive circle, and a rotary drill bit with a 3½-in. square kelly bar.

Two of the smaller rigs are Chevrolet mounted, have Hercules engines, American hoists, and 30-in. augers. The fourth rig is mounted on an International truck, has a Ford engine for power, an American hoist, and a 30-in. bit.

Case and Under-Cut Holes

The rigs average a hole every 8-hour shift. With the aid of cutting wings or reamers, the holes are drilled 68 inches in diameter and from 31 ft. 7 in. to 33 ft. 7 in. deep. Material brought up is dumped to one side, pushed out of the way by dozer if necessary, and excavated later by the shovels. The holes are then cased with four heavy sections of steel casing, which are dropped in by either a Lorain MotoCrane or a Bucyrus-Erie 38-B crane. An under-reamed spread footing is mucked out by hand at the bottom of each hole, a base piece is installed, and the 8-ton A-section is then lowered down to position. The piece is then concreted in, the casing is pulled, and the hole is tightly backfilled. This will leave it tight against the bank when the remaining bench is cut away.

To insure that the original ground is never disturbed too much at any one point, the A-section holes go down first on 27-ft. centers. Then the machines

Continued on page 55

● With excavation now down to grade in southeast corner, a Bucyrus-Erie ¾-yd. 22-B dragshovel begins cut for footings in the garage building.

• With final excavation completed and retaining wall and check dam poured, Depoe Bay awaited the storm. Note the diversion flume in foreground.
Photos courtesy Corps of Engineers

Stretch Small Boat Harbor

by Paul Gillem

Fishing boats putting in at Depoe Bay, Ore., now have more room and improved docking facilities. The harbor enlarging work was done under a $280,525 Corps of Engineers contract let to Kuckenberg Cons. Co., Portland.

THAT cofferdam had better hold," said Lee Gordan, project superintendent for the Kuckenberg Construction Co. of Portland, Ore. "It's all that keeps that sea off the backs of our necks!"

I could understand Lee's concern. We stood on a rocky, timbered hillside overlooking the now-dry floor of Depoe Bay, one of the most picturesque and rugged of the many small inlets that dot the Oregon coast. Below us, where once a fleet of fishing boats had rolled smoothly at anchor on the calm waters of the bay, scores of workmen worked now in silt and muck, hurrying to put the finishing touches to the company's $280,525 contract for enlarging and deepening the harbor before the fall storms made the work too hazardous to complete. They were protected from the ocean by a 30x140-ft. cofferdam, stretching across the narrow channel from the sea.

The temporary dam was built by sub-contractor Ernie McQueen, of the town of Depoe Bay, and it literally fought the Pacific Ocean off the backs of the men of the Kuckenberg outfit for 5½ months. During that period the contractor reshaped this tiny but highly important base used by both commercial fishing vessels of the Columbia River Packers Assn. and a sizable fleet of deep-sea charter and pleasure boats. Located on the Oregon coast, approximately 100 miles

southwest of the city of Portland, the relatively modest project turned out to be a continual battle with the sea.

Although so small it scarcely makes a dent in the ragged and scarred coastline shown on Oregon maps, Depoe Bay has long been a mecca for tourists who come to gape at the strange specimens of marine life displayed in the public aquarium, to venture out for a day of deep-sea fishing, or to just stop and admire the colorful and rugged setting of this little harbor nestled against the mountains of the coast.

Enlarge Harbor, Deepen Channel

Just as rugged, though certainly much less colorful from the boatman's point of view, was the narrow channel the small boats had to negotiate to enter or leave the bay. Barely wide enough to accommodate one good-sized fishing vessel, and lined by jagged reefs, it was a skipper's nightmare—grade A.

Once inside, the vessels were fairly safe from any storm that might sweep in from the broad reaches of the Pacific, but with the coming of low tide another hazard presented itself. The shallow depth of the harbor caused most of the water to flow back into the ocean, frequently leaving boats high and dry on the floor of the bay.

Under authority of the Civil Works Appropriation of 1949, the Portland district of the Corps of Engineers made preliminary surveys and called for bids on an extensive face-lifting job on the bay and its connecting channel. Original specifications provided for widening of the harbor from a usable boat space of 125x350 feet to an area of approximately 350x750 feet (This was later changed to an average width of 390 feet—an extension of 15 feet, for which the contractor received an additional $8,475). The harbor was also to be deepened from an average of five feet at mean low tide to a new depth of minus eight. In addition, specifications called for construction of a 15-ft. concrete breakwater to extend 160 feet beyond the mouth of the harbor as a protection against heavy winter seas which sometimes swept into the channel from the north side. A concrete retaining wall 660x21 feet with a 13-ft. base was to be built along the east shore of the bay for moorage, and a check dam to prevent further silting of the basin erected across the mouth of Depoe Creek, a small stream flowing into the bay at its southeast end.

The Kuckenberg firm was awarded the contract on a bid of $272,050 in April of 1950, and with 200 calendar days in which to complete the job, work was begun on the 17th of the month. Work was under the direction of the district engineer, Portland, Ore., District Corps of Engineers.

• Contractor Larry Kuckenberg (right) and Project Superintendent Lee Gordan pause in inspection round for photo before 21-ft. retaining wall at east end of project.

Drain Bay

Work commenced with the construction of a 1,100-ft. wooden diversion flume to carry the waters of Depoe Creek to the sea. Sub-contractor McQueen, using strippings and quarry waste, completed construction of a cofferdam, and two 25-hp Pacific electric pumps with 8-in lines and a rated capacity of 2,200 gpm, started siphoning out the waters of the bay.

Five days later, the bay floor was dry enough for Harold Gilmore, Kuck-

• Below (left): Northwest 6 shovel edges southwest side of basin. Bay depth here before excavating was extremely shallow and machine worked in comparatively dry soil; (center) Two Caterpillar D8's move Gar Wood 20-yd scraper through muck on floor of basin. Operators avoid pot hole just to right of lead cat; (right) Thor jackhammers powered by 500-ft. Ingersoll-Rand compressor were used to loosen packed sandshale for Bucyrus-Erie 20-B clamshell during construction of check dam across mouth of Depoe Creek.

• The 160-ft. breakwater was poured in five sections during periods of low tide, losing only one section to the sea. Here workmen complete first section.

• Clamshell on Bucyrus-Erie 20-B finishes excavating for plywood form section. In background Northwest 6, 1½-yd. shovel does preliminary digging for retaining wall, which is 13 feet thick at base.

• Wagner Scoopmobile dumps sand into hopper of Johnson batch plant which turned out 200 yards of concrete per 8-hour shift during height of operations. Three K-6 International 6x6's hauled aggregate three miles to batch plant.

enberg's excavation foreman, to move in with three model 525 Gar Wood 20-yd. scrapers, one model 80, 14-yd. Caterpillar scraper and two Wagner Scoopmobiles and begin the job of excavating 105,000 yards of gray sand-shale and dirt. His tractors consisted of six Caterpillar—five D8's and a D7, equipped with Caterpillar blades. A Bucyrus-Erie 20-B ¾ yd. shovel and a model 6, 1½-yd. Northwest shovel completed his equipment. The majority of the excavated material was ripped and then spread on adjoining properties.

From the very beginning unforeseeable trouble plagued Ernie McQueen's cofferdam. The constant pounding of unusually heavy seas caused frequent washouts, which though not extensive, were serious enough to hinder operations. Seepage became a major problem, and at times it was all the pumps could do to keep up with it.

Muck Plagues Excavators

Meanwhile, Foreman Gilmore's excavating crew was having troubles of its own. The seepage from the dam was augmented by hidden springs and pot holes in the floor of the bay.

But all this time Ernie McQueen, aided by the Kuckenberg men, had literally been plugging away at the contractor's cofferdam. They found it an around-the-clock job, and it seemed that nothing they could do would make the structure impervious to the probing sea water. As soon as one weak spot was remedied the pounding surf would create two more. But they kept doggedly patching away, while the pumps ran red-hot, the machines bogged and stalled and men floundered and slipped in the mud.

Odd Mixture Plugs Dam

Finally their perseverance, laced with a good deal of on-the-spot ingenuity, won the day. At Harold Gilmore's suggestion, they trucked in two 35-ft. semi-trailer loads of baled straw, added a couple of truck loads of manure, and placed it in the dam to form a solid core. On top of this they dumped more rock and quarry waste, and waited to see what would happen. And what happened was good! The dam tightened and held, seepage was reduced to a minimum, and the overworked pumps at last got a breather. Thereafter, during the height of operations and right up to almost the last week of work,

only intermittent pumping was needed to handle the water.

Preparations for pouring the 5,090 yards of concrete required for the breakwater, retaining wall and check dam were initiated by the Kuckenberg crew with the arrival of a Rex 1-yd. paver and the installation of a Johnson batch plant and Spence silo. The batch plant was equipped with an elevator made by the contractor, and had a capacity of 200 yards per 8-hour shift. Aggregate was obtained from Thomas quarry, three miles from the project site, where a single pit shot and eight secondary shots using 4,000 pounds of Pacific 40% powder, made 12,000 yards available. Six thousand yards of this was also used as fill in cofferdam. Three K-6 International 6x6 trucks mounting 6-yd. dump bodies built in Kuckenberg's Portland shops, were loaded by the Northwest 1½-yarder for the easy haul to the batch plant.

Re-use Forms

By now things were beginning to hum. Excavation in the bay was going forward nicely, with the Bucyrus-Erie 20-B shovel loading out the heavy muck. The cofferdam was holding well, and the job of handling forms for the 160-ft. breakwater was started without incident.

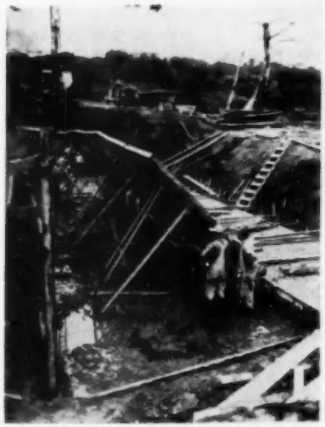
The breakwater forms were built in five sections during periods of low tide. Pouring of the 350 yards of concrete in the structure was accomplished in the same manner, and except for the loss of one section, proceeded pretty much on schedule.

• Prefabricated plywood forms were erected to hold the 350 yards of concrete in check dam. Concrete apron, measuring 10x70 feet, two feet thick, was poured before main part of dam.

A considerable economy in time and form material was effected by the contractor's unique method of pouring the 4,740 yards of concrete in the retaining wall along the east shore of the bay. Fifty days of pouring completed the job, using pre-fashioned plywood form sections 50x14 feet in size which were assembled on the job and hoisted into place using the Bucyrus-Erie 20-B and the Northwest shovels rigged as cranes. As soon as the concrete in one of these sections had set the form was partially knocked down and shifted. This system of operation enabled the structural crew to keep up with the excavation, as well as effecting a considerable saving in form material costs.

Blast Channel

Blasting of 2,000 yards of lava rock from the channel was accomplished in 10 days. Four Thor jackhammers powered by two Ingersoll-Rand 500-ft. compressors drilled a total of 1,200 holes for the powder. Drilled with 2⅛-in. throwaway bits, these holes were



sunk to a depth of six feet. Sixty holes, each loaded with 1½ sticks of Pacific 40% powder, were fired at one time using a blasting machine and Primacord. In all, a total of 20 shots were fired, using 1,000 pounds of powder.

By the middle of September the men of the Kuckenberg crew felt that they were winning their battle against time and the elements. Concrete work on the check dam had been finished, 350 yards being poured in 14 days to plywood forms similar to those of the retaining wall. The dam is 155x17 feet, with a concrete apron on the downstream side measuring 10x70 feet, two feet thick. A fish ladder was installed to permit passage of the salmon which each year migrate from the sea to spawn in the upper reaches of Depoe Creek, and with the exception of the final blasting of that part of the channel now covered by the cofferdam, the job was almost completed.

The cofferdam had held firm through 5½ months of steady pounding by the sea, and by now most of the men of the Kuckenberg crew had almost forgotten that an angry ocean still searched for the slightest weakness in the barrier that protected them and their equipment.

Fear Fall Storms

Among those who had not forgotten, however, was Superintendent Gordan and the contractors themselves, Larry and Henry Kuckenberg. They had kept in constant touch with the project, flying down from Portland at regular

• Raging seas breach cofferdam across channel entrance at Depoe Bay. Breakwater (upper left) is almost obscured by high waves. Within 24 hours the bay floor was covered by over seven feet of water.

intervals in a Beechcraft Bonanza monoplane piloted by Larry. These men knew that September is the month when anything can happen on the weather front along the Oregon coast. They remembered sudden September storms that had roared in from the Pacific before, storms that had raked the coast from Alaska to California, smashing harbor installations, wrecking shipping and even sweeping away highway bridges as far inland as a half-mile from the beaches. Remembering this, the three men had kept their fingers crossed, hoping the weather would hold throughout the month.

Water Pours In

Then, on the night of September 23, Lee Gordan stood on a hillside back of the bay and watched a heavy mist roll in from the sea. He watched it move in until it obscured the breakers that were bursting with steadily increasing force on the off-shore reefs. He felt the freshening wind making from the southeast—always a bad sign on this coast—and suddenly he was thankful that the job was nearly done, that his men and equipment were safely off the floor of the bay. He was sure that the good weather was running out.

He was dead right. All that night the wind increased in velocity. By daybreak a howling Pacific gale was lashing at the sea, whipping white spume from the tops of the combers that crashed against the cofferdam.

Nothing short of reinforced concrete could withstand a pounding like that, and Ernie McQueen's cofferdam was not made of reinforced concrete. Inevitably, it breached. By the next morning—Sunday, the 24th—the raging seas had smashed a 40x15-ft. hole in the structure through which tons of water poured into the bay. By nightfall, the cofferdam was reduced to a heap of barnyard rubble, and over seven feet of water covered the floor of the basin where Kuckenberg's men had labored all summer.

The next morning Lee Gordan and other Kuckenberg job executives took stock of the situation. Things could have been a lot worse, they decided. The storm could have struck during the critical weeks just behind them. As it was, under the terms of the contract they still had 40 days remaining in which to remove the debris of the cofferdam and to complete the final blasting of the channel. Barring unforeseen happenings, they felt they had a good chance to finish the job on schedule.

Drag Muck From Channel

Work of clearing the channel was begun immediately, using a dragline front end on the Northwest model 6 shovel to cast to dozers which spread the waste material along the rocky beach. Ordinarily this would be a simple enough procedure, but it soon became apparent that the excavating crew was in for more trouble from their old enemy, the sea. New storms continued to flail the coast, making it impossible to work at the channel mouth in anything less than a submarine. The crew was finally forced to a 2-day work week, clearing the channel as best they could during brief lulls in the storms. Working this way, it took them a full month's time to complete the job, instead of the seven or eight days originally figured.

Blasting operations in the channel entrance had been scheduled to begin as soon as the work of clearing was finished, but it was not until the latter part of November that Harold Maiken, a professional diver hired by the contractor, could make his first descent. Continuing weeks of some of the most perverse weather the Oregon coast has ever experienced had kept the channel a seething cauldron in which nothing could live, and diver Maiken had wisely stayed land-bound. But now with a slight break in the weather he was ready, and although the seas were still dangerously high, he set up his equipment on the rocks bordering the channel and went to work.

Carrying standard demolition blocks of 2½ pounds of T.N.T., in churning currents so powerful that he was often forced to crawl on his hands and knees, the diver fought his way to the underwater blasting site. It was ticklish work, but with the philosophy of the born diver Maiken treated it as strictly routine.

Place Charge Without Packing

Oddly enough, he found that the current within a foot or so of the bottom of the channel lost much of its turbulence and the charges could be laid on the rock without sandbagging. The blocks were set a foot apart in

Continued on page 55

● Here is completed Depoe Bay project with retaining wall (left) and check dam (upper center). New depth of minus 8 enables small boats to enter or leave bay at low tide without grounding.

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DEPENDABLE big output, reliable shift-after-shift performance . . . these are reasons why contractors prefer Bucyrus-Erie excavators. In construction work where speed is vital and lost time costly, Bucyrus-Eries stay on the job — building roads, digging basements, on the most demanding excavating and material handling work. Their records show why Bucyrus-Erie ⅜- to 4-yard gasoline, diesel and single-motor electric excavators are

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More speed—8 forward and 8 reverse speeds up to 7.8 mph for faster time cycles on the job.

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The TD-24 gets in and out and back in again faster—moves more dirt each time—makes more money for its owner every working day.

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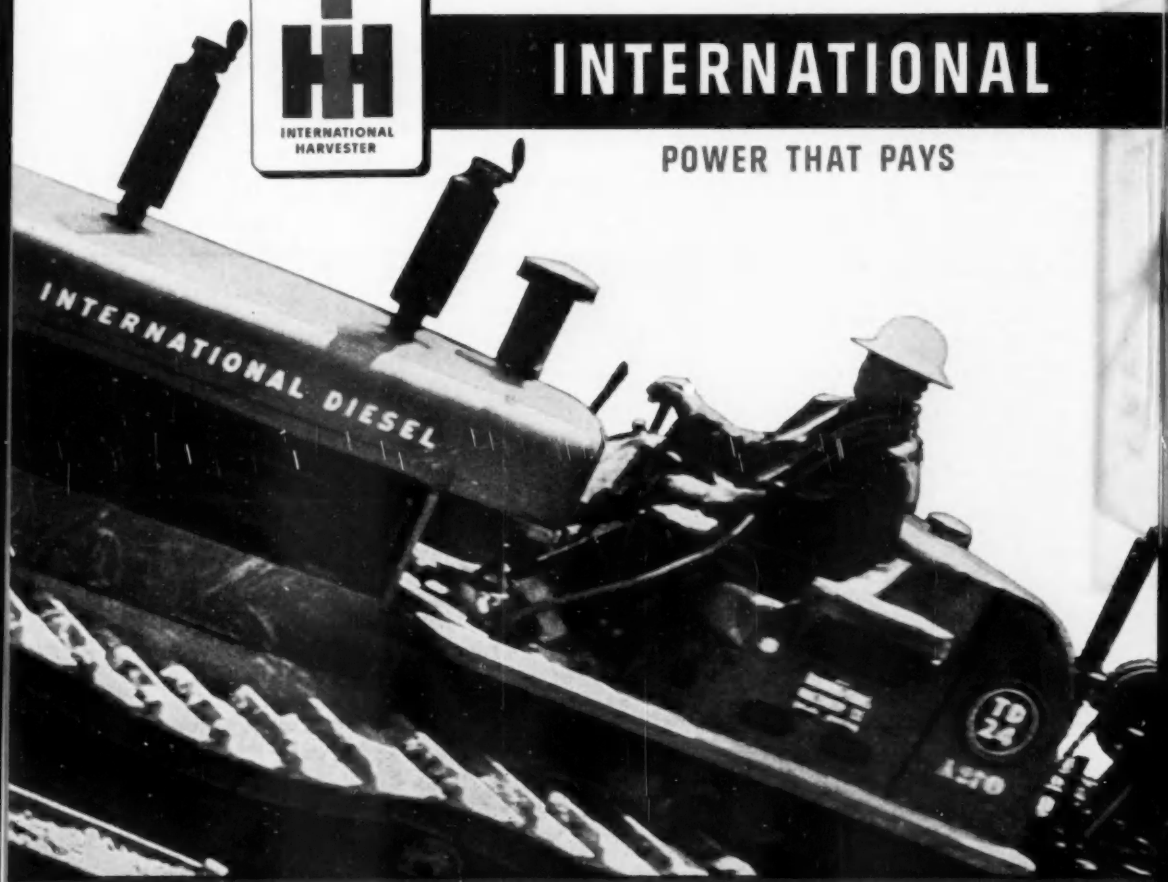


News from the Field

Palisades Dam Approved As Defense Project

The U. S. Department of the Interior recently approved recommendations by the Defense Electric Power Administration for expeditious construction by the Bureau of Reclamation, of Palisades Dam and power plant on the main stem of the Snake River at Calamity Point, in eastern Idaho. Construction will commence as soon as funds are available.

The big multiple purpose Reclamation project will provide additional irrigation water for 650,000 acres of Upper Snake River Valley farm lands, for which water supplies are now inadequate. Also, it is urgently needed to help meet growing defense electric power loads in the Pacific Northwest.

The power plant will have an installed capacity of 112,500 kilowatts and, in a median water year, will produce approximately 500 million kilowatt hours of electrical energy.

An immediate appropriation will be recommended to get started with construction, looking toward the availability of first power in 1955. The project has already been authorized by the Congress and some $3 million have been spent on preconstruction work.

Hold 1951 Safety Meet in Chicago

The 39th National Safety Congress and Exposition will take place October 8 to 12 at Chicago. Sessions will be held on industrial safety, traffic safety, commercial vehicle and farm safety, school safety, and home safety. Further information may be had by writing R. L. Forney, general secretary, National Safety Council, 425 N. Mich. Ave., Chicago 11, Ill.

Kentucky Hy. Dept. Precasts Bridge

The Kentucky Department of Highways recently utilized the prefabrication process to cut by two-thirds the on-site time required to erect a bridge. The bridge involved is a small structure serving traffic on U. S. 62, between Cynthiana and Georgetown. It was completed this spring and was constructed of prefabricated concrete slabs which were cast in forms in the Sixth District State Highway Garage. Workmen precast the concrete structural units of the bridge during winter days when inclement weather rendered work on outside projects impractical.

While the idea of prefabricating concrete units for structures of many kinds is not new, here was another practical application of the idea. For the U. S. 62 bridge, eight of the 3 x 24-ft. sections were cast and transported to the site on trailers and time for building forms and for allowing the cement to set was eliminated. The completed bridge measured 22 ft. 6 in., clear span, and 22 ft. wide.

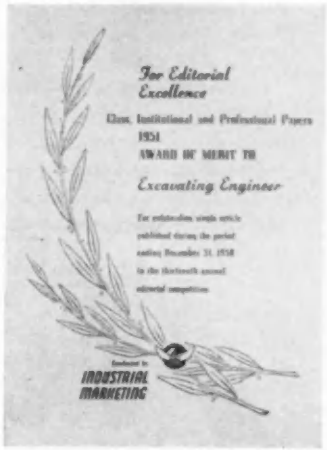
Nebraska Pushes Construction Program

Projects totaling at least $679,000 will be completed on 20 airports in Nebraska within the next year, according to James Ramsey, director of the State Aeronautics Department.

Additional projects amounting to about $71,000 are expected to be completed in two years at five airports, he said. The federal government will pay 35% of cost of the projects, the state 20% and localities about 45%.

Prior to the start of the 1951 program, Nebraska ranked third in the nation in the number of projects approved by the federal government, trailing Texas and California, Ramsey said, adding that he expects the state to pass California for second spot when this year's program is completed.

EE Turnpike Story Wins Award



EXCAVATING ENGINEER recently won the certificate of merit in the 13th Annual Industrial Marketing Editorial Achievement Competition. The award

Charles Nathan Becker

Charles Nathan Becker, 56, prominent phosphate and mining equipment company executive, died in a Tampa, Fla., hospital on May 21. He had been in ill health for several months before his death.

A native of New Brunswick, N. J., Mr. Becker came to Bartow 28 years ago. He was associated with Southern Phosphate Co. until 1946, as assistant manager and manager. For the past five years he has been associated with his brother-in-law, J. W. Booream, in the R. H. Clark Equipment Co., of which Mr. Becker was manager and vice president.

A Navy veteran of World War I, he was a member of the American Legion. He was a past president of the Bartow Kiwanis club, and for a number of years he was active in Boy Scout and Sea Scout work. At one time he was an active member of the American Institute of Mining Engineers.

He was a member of the Episcopal church.

Mr. Becker is survived by his widow, Mrs. Mary Ann Booream Becker; a son, John Nathan Becker, Dunnellon; a daughter, Mrs. James G. Gilchrist, Jr., El Paso, Texas; two grandsons; and a brother and sister, J. D. Becker and Miss Marie Becker, both of Avon by the Sea, N. J.

for "an outstanding single article published during the period ending December 31, 1950" was given to the magazine for its staff-written construction article "Pennsylvania Turnpike to Span State" which appeared in the December issue. Winning entries were announced in New York on June 27 during the annual conference of the National Industrial Advertisers Association. It was the second winner in a row for EXCAVATING ENGINEER. In last year's competition, the magazine received similar recognition for a series of safety articles.

Build Large Underground Warehouse in Kansas

A $1 million project to develop one of the largest commercial underground warehouses in the world is being undertaken in Kansas on a 540-acre site between Loring and Lenape in Wyandotte County.

The project is being developed by the National Storage Co., which estimates the warehouse eventually will contain 500,000 square feet of floor space. It is being dug out of a 100-foot-high limestone bluff. Eleven acres have already been mined and about 125,000 square feet were scheduled to be ready for use by August 1.

Some compartments of the warehouse will be kept at the natural temperature of the cave, about 55°. Other compartments will be refrigerated to as low as 10° below zero for storage of frozen foods. About 35 persons will be employed by the company.

U. S. Aids India Program

Hugo Marek, Jr., Bureau of Reclamation engineer, is en route to New Delhi, India, for a year's tour of duty as technical advisor to that government on foundation explorations and treatment at Indian damsites. Mr. Marek will devote particular attention to the construction of the Kakrapar Dam on the Tapti River in the State of Bombay and Hirakus Dam on the Mehanedi River in the State of Orissa.

Mr. Marek's assignment was made at the request of the Indian Government, which will defray the cost of his trip and services. He is the 29th member of the Bureau of Reclamation technical staff who has been "loaned" for foreign duty under foreign technical assistance programs.

New British Tunneling Record

A British tunneling record has been set by teams working 8-hour shifts round the clock for a week, from June 3 to 10. In the 168 hours they drove 427 feet through diorite rock forming the mountains of the Cobbler Range,

same men, same tools do
4 days' work in 3

35% more footage
with 3 heavy rock drills
because, with 365 instead of 315 ft. of air, you hold full pressure instead of 70 lbs. in the tools.

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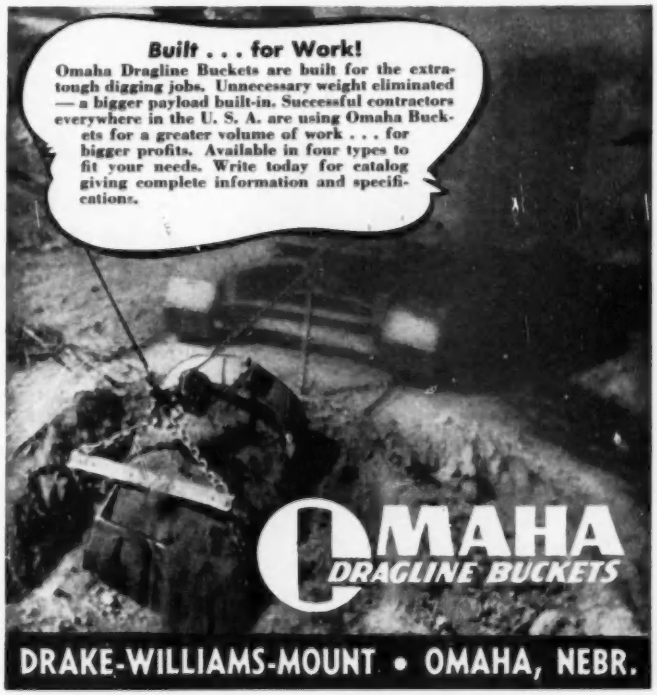
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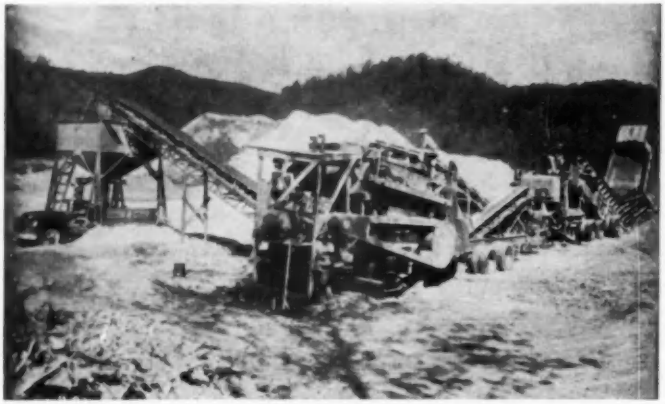


● A portable rock crusher operated by Aggregates Producers, Inc., of Charlotte, N. C., is easily moved without removing the engine from the rig. This saves two days each time a move is necessary by eliminating the job of removing and remounting the engines. The primary unit of the rig is a 24x36-in. Pioneer 151 PLR jaw crusher powered by a 6-cylinder Diesel engine. The secondary unit is a Pioneer 40-in. triple roll crusher powered by a GM Twin-6 Diesel. A one day peak output reached 2,194 tons with three 10-ton Euclids bringing in rocks up to three feet in diameter.

Scotland, easily beating the previous record for British tunneling of 334 feet. The contractor is Edmund Nuttall, Sons & Co., Ltd., London.

The tunnel is one of many being driven for the great Loch Sloy hydro-electric scheme, and the 7 ft. x 7 ft. shaft will carry water from above the Rest-and-be-Thankful hill summit to Loch Sloy reservoir, to increase the catchment.

Three gangs of 10 men worked during the record-breaking week, seven men of each shift being at the face, where 66 rounds were fired and cleaned out. Eimco 12 loaders were used, with a 2-ft. Jubilee track and Hudson 25 ft. Mersey-type wagons, which were evolved from experience gained during the excavation of the great Mersey Tunnel.

Altogether, in 31 consecutive working days, 1,231 feet were driven, another British record.

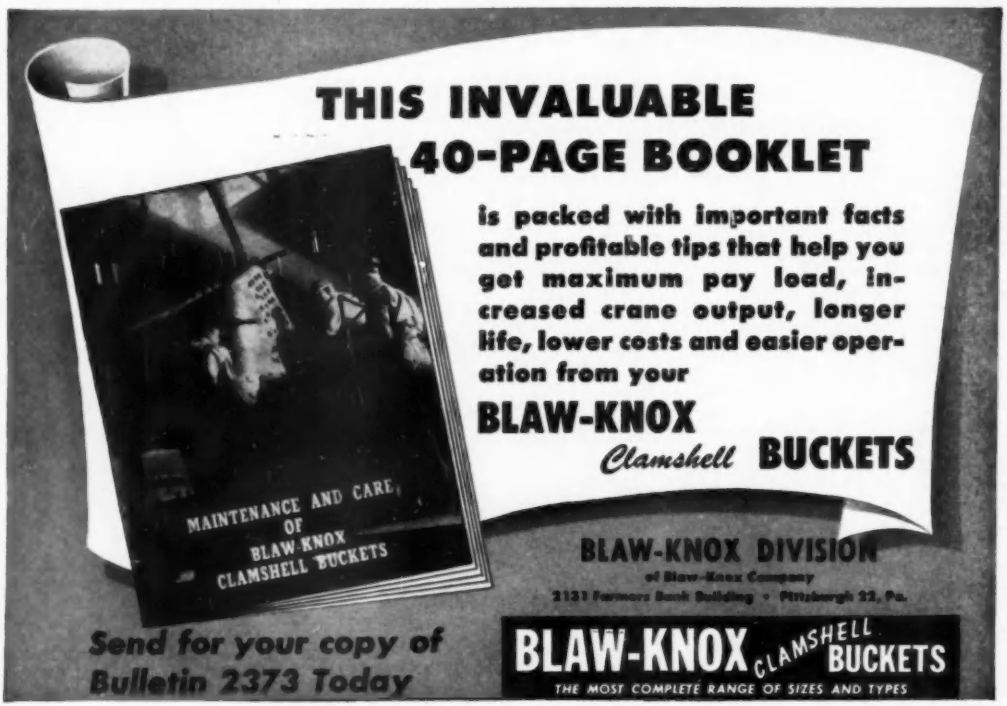
The records were made using light one-man Atlas rock drills and Sandvik Coromant hard metal drill steels.

Norfolk, Newport News Bridge-Tunnel Planned

The Virginia Highway Department is working toward the construction of a $42 million bridge-tunnel across the 4-mile Hampton Roads water barrier separating the Norfolk and Newport News areas.

A recent preliminary report from Consulting Engineers Howard, Needles, Tammen and Bergendoff, New York City, was termed "very encouraging" by highway officials and plans were made to immediately ask the Army Engineers for a permit to construct the bridge-tunnel-causeway crossing.

Both the consultants and the state highway department emphasized that the report is preliminary in nature and that feasibility of the project is de-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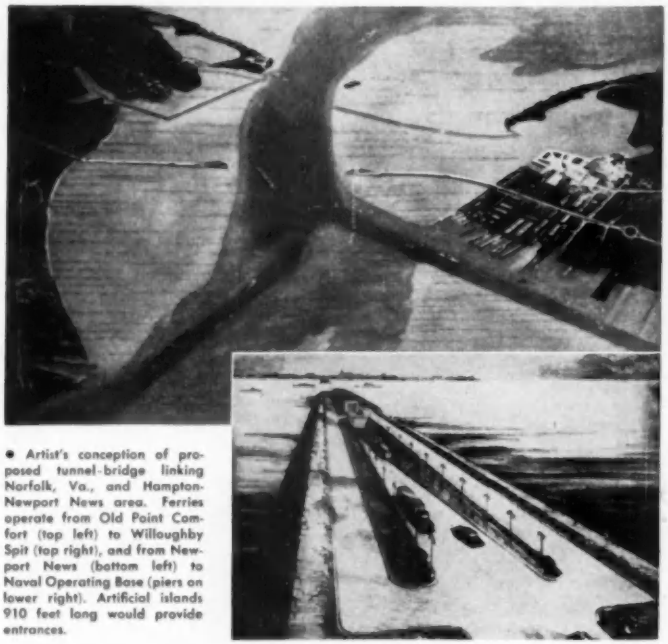


• Artist's conception of proposed tunnel-bridge linking Norfolk, Va., and Hampton-Newport News area. Ferries operate from Old Point Comfort (top left) to Willoughby Spit (top right), and from Newport News (bottom left) to Naval Operating Base (piers on lower right). Artificial islands 910 feet long would provide entrances.

Edwin H. Parkhurst

Edwin H. Parkhurst, Cleveland industrialist, died June 22, at the age of 79.

Born in Barnard, Vt., April 10, 1872, Mr. Parkhurst was secretary of the Vermont Belting and Packing Co. of New York City from 1897 to 1902 and vice-president of the Peerless Motor Co., Cleveland, with whom he was associated from 1903 to 1913. He was with Columbia Axle for 22 years, resigning as president in 1937. He served as president of The Euclid Road Machinery Co. from 1937 until recently.

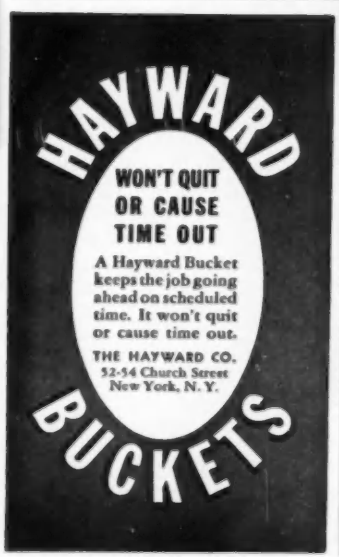
Mr. Parkhurst had been a director of the Bank of Ohio, Addressograph-Multigraph Corp., Cleveland Tractor Co., and the American Savings Plan Assn. He was a member of the Mayfield Country Club, Union Club and the Cleveland Chamber of Commerce.

pendent on approval by the Army and Navy of design and location, and on further traffic and engineering studies. The project is taking on very definite lines, however.

The crossing would consist of a combination causeway-bridge tunnel with a viaduct over the Naval Operating Base of Norfolk. The tunnel would be under the main channel and would be approximately 7,200 feet long between portals. The connection between the north portal of the tunnel and the north shore line would consist of a combination causeway and low level bridge 6,500 feet in length.

At each portal of the tunnel would be an artificial island 910 feet in length which would contain the ventilator buildings and equipment. The overall length of the facility would be 21,750 feet, or just about four miles.

The northern approach would be



• International TD-24 crawler with Bucyrus-Erie cable-operated dozer fills washouts on 4¼-mile improvement to State Route No. 122 between Middletown and Eaton, Ohio. John R. Jurgensen, Newton, Ohio, has the $370,000 general contract which calls for 90,000 yards of dirt moving, construction of a 190-ft. bridge, and the laying of 22-ft. asphalt pavement. Dirt-moving equipment being used in addition to the TD-24 shown includes: two Heiliners, Allis-Chalmers HD-19 and scraper; International TD-24 and scraper; Caterpillar No. 12 motor grader; two International TD-18's with dozers; Lorain No. 75 shovel and a Lorain No. 41 backhoe and crane; and a Case wheel tractor pulling a sheepsfoot roller.

about mid-way between Newport News and Old Point. It would first connect with Route 167 and then would cross four major highways to join U. S. 258, the Newport News-Hampton bypass.

The southern approach would cross the property of the Navy at the Naval Operating Base and connect with both Hampton Boulevard and Taussig Boulevard, thus serving the main entrances into Norfolk and to Virginia Beach. It was estimated that construction could begin by the latter part of 1952 or early 1953 and the project be opened to traffic by 1956.

Change Kentucky Bid Procedure

Changes in procedure to attract more bidders on highway construction projects in Kentucky were inaugurated recently by the Highway Department.

In the future, proposal forms may be secured, during the official business hours, until one hour before the advertised time of the letting. It is believed this extension of time may draw additional bidders who may decide at a late hour to bid on a particular project.

Also altering a practice of many years' standing, the department will no longer issue lists of prospective bidders on projects. As a consequence of extending the time for issuance of the proposal forms to one hour before the letting, it will not be possible to compile in advance the lists of prospective bidders.

The present charge of $10.00 for proposal forms will be reduced to $2.00, at least for a trial period. The charge was made necessary originally because of the practice of some contractors in requesting proposals on many projects on which they had no intention of bidding.

Slag Production Record Set in 1950

A new record output of 24,926,033 short tons valued at $29,480,858 was established by the iron blast-furnace slag industry in 1950. These statistics are based on a canvass conducted by the National Slag Association of the 42 companies operating 63 plants for processing air-cooled slag, and 12 companies operating 17 plants for expanding slag. The results of this canvass were assembled in cooperation with the Bureau of Mines, U. S. Department of the Interior.

Screened air-cooled slag, the major production, reached a new total of 20,047,844 short tons, an increase of 13% over the 1949 figures. Of this total, 17,908,480 short tons, or 89%, was used as railroad ballast, as aggregate in portland cement concrete, bituminous construction of all types and miscellaneous highway construction uses. Other uses accounting for the balance were in mineral wool, concrete block, agriculture, sewage trickling filter medium, slag roofing, and miscellaneous.

Record Day's Pour at HH

All single-day concrete placing records at Hungry Horse Dam were shattered on Sunday, June 10, when General-Shea-Morrison construction crews placed 8,065 yards of concrete in the huge multiple-purpose dam on the south fork of Montana's Flathead River. Best previous record, figured on the basis of 3-shift, midnight to midnight operation, was 7,957 yards on June 2. High blocks in the dam now tower 299 feet above the lowest point in the bedrock foundation. When the dam is completed late in 1953, it will be 564 feet high, ranking third behind Hoover (726 feet) and Shasta (602 feet) among the world's highest concrete dams.

Loan Three Interior Dept. Engineers

Two Bureau of Reclamation engineers and a ground water geologist left recently for separate assignments in

Medium sized Sauerman Slackline Cableway, installed in 1928, has dug and moved many hundred thousand cubic yards of sand and gravel from this pit to the screening plant with minimum expense and repairs. Still good as new after 27 years' service, the machine continues to maintain its rated capacity.

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For greater efficiency and economy on long haul work such as the excavation of materials under water, across deep pit, sludge or bog, the Sauerman Slackline Cableway is your best bet. This versatile machine digs, conveys, elevates and dumps in a rapid, continuous cycle under the control of a single operator. It digs with ease in almost any kind of ground—reaches deep into pits, ponds, gulleys or rivers and moves heaping loads at a rapid rate to a high delivery point. Result: more yardage moved per hour, at less cost per yard. Low initial cost . . . low power consumption, either gasoline, electricity or Diesel. Simple installation and upkeep. Sizes: ½ to 3½ cu. yd.

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By reason of its versatile adaptability to all kinds of heavy hauling jobs, the Rogers Type "T" has steadily increased in popularity.

It's a "natural" for small and large contractors and haulers.

If you are considering the purchase of one or more trailers, by all means investigate the Type "T".

It packs powerful advantages in a multi-purpose single unit.

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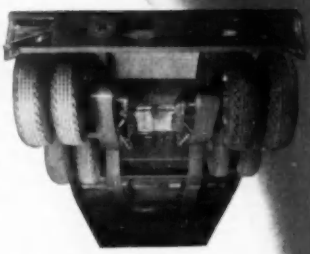

A worms-eye view of the sturdy rear end and frame construction of the famous "T".

The rear end design of the Type "T" has proved so efficient it has been adopted as standard construction in Rogers Power-Lift Detachable Gooseneck Trailers.

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Northern Rhodesia and Italian Somaliland to assist those countries in water resource and irrigation development problems. Assignment of the three Interior experts was made at the request of the Economic Cooperation Administration and the British and Italian governments. Their departure for overseas will bring to a total of 32 the number of Bureau technicians who have been on foreign duty in 21 widely scattered countries under ECA or State Department programs.

Iron Abounds On Ocean Floors

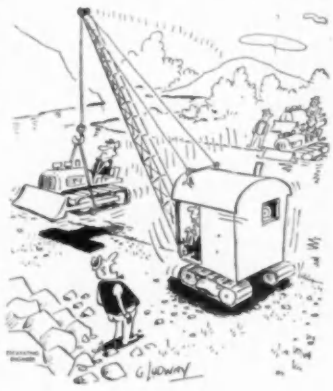
Iron is abundant on the floors of the oceans, according to American Iron and Steel Institute.

The iron bearing mineral is called glauconite. It is a greenish, granular mineral, deposited slowly near the mudline along seacoasts at depths of 600 to 5,000 feet, away from large or swiftly flowing rivers. The mineral contains about 23% iron. It is formed when shell fish, after death, become filled with fine mud which contains iron leached from rocks on the land.

Glauconite is a close chemical relative of the taconites found in the sedimentary rock deposits of the Lake Superior region.

Iron is also present in sea water in organic form, that is, in a form produced by animal or plant action. The iron, originally in inorganic form derived from the leaching rocks, is removed from solution by plankton. These are primitive, usually minute, marine or fresh water plants and animals, often found in colonies.

Some sea creatures concentrate alloying metals used in steelmaking. That concentration is so low, however,



"He can't swim."

that it is improbable that commercial use will be made of any of them in the foreseeable future. Lobsters, for example, concentrate cobalt; oysters concentrate copper; scallops concentrate nickel; sea slugs and a sea animal called an ascidian concentrate vanadium, while mussels and plankton concentrate manganese. Marine plants also concentrate steelmaking elements such as boron and molybdenum.

Irish Ingenuity

From Mr. G. Armstrong of J. H. Saville & Co., Ltd., Santry Co., Dublin Ireland, comes this item.

A local golf club decided to remove several large rocks which were embedded in the fairways and were a source of annoyance and potential danger to players. An engineering firm was consulted and they took drillings of the rock. Eventually an estimate for the work was received, but the cost was more than the club could afford.

A local handyman, hearing of the difficulty, offered to do the job for $280. His offer was taken up although regarded with some scepticism. The handyman duly arrived on the scene with a donkey and cart, loaded with turf, which as you know is largely used here as fuel, and is perhaps better known in America as peat. He proceeded to pile the turf around one of the big rocks, set it on fire, left it to burn and returned a couple of days later. The rock was found to have split up into easily handled pieces, which were removed by the same donkey and cart. Later this enterprising gentleman sold the stone to the local council for roadmaking, thereby being paid twice for his work.

"I realize you're new here Jordan, but when a bit goes we don't throw away the whole drill."

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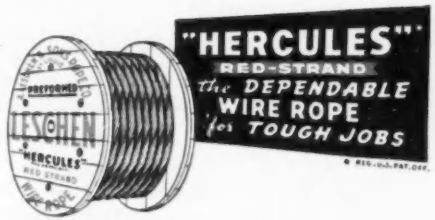

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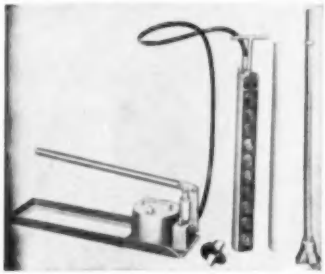
Hydraulic Rock Breaker



Manufacturer: Duncan Roc-Jak, 1350 Wright St., Los Angeles 15, Calif.

Claims: Hydraulic rock breaker for demolition of mass concrete or ledge rock where the use of explosives or ball drop is prohibited or impractical. The Roc-Jak is noiseless, dustless and safe. It can be operated by one man. The breaker body is 24 inches long and 3 inches in diameter. Each breaker is heat-treated and piston openings precision ground. The 10 hardened 1⅝-in. alloy steel pistons are fitted with neoprene cups tested to withstand 15,000 psi. Each unit is equipped with an equalizing shim, hydraulic pump, hose, drill rod and six 3½-in. drill bits. The weight of the Roc-Jak with hose and pump is approximately 94 pounds.

Automatic Telephone

Manufacturer: Electronic Secretary, Inc., Milwaukee 4, Wis.

Claims: Automatic telephone for contractor field offices answers the phone automatically, takes messages and also tells the caller when contractor will return. In case of an emergency at night, the caller is told where his party can be reached. The Electronic Secretary is easily installed as it is not connected to the phone. And the unit serves as a handy portable dictation machine.

Moto Mixer

Manufacturer: Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.

Claims: Improved Moto Mixers that are made in three sizes with maximum capacities of 3 yards, 4½ yards and 5½ yards respectively.

Among the improvements is the new single strand chain drum drive. This single strand chain gives greater overall efficiency and lower chain maintenance costs.

All mixers are now equipped with drop-forged, frame-hardened drum rollers. Alloy metals and improvements in fabrication methods have resulted in a stronger, substantially lighter frame permitting more strength and lowering weight of the entire machinery.

The newly located water pump is driven by a V-belt directly from the engine crankshaft. The new location simplifies replacements and adjustments. The spouting equipment also has been improved.

Masonry Drill Bit

Manufacturer: New England Carbide Tool Co., Inc., Cambridge 39, Mass.

Claims: Cyclo-Core drill bit designed for precision drilling in concrete, glazed tile or other hard masonry materials using a rotary type drill with pressure applied, for holes ¾-in. diameter

22-Ton Rear Dump

Manufacturer: Euclid Road Machinery Co., Cleveland 17, O.

Claims: Two new rear-dump models of 22-ton capacity with spring mounted drive axle. The model 45TD is powered by a Buda engine of 286 hp, and the model 46TD has a 300-hp Cummins engine. Both models have a 10-speed transmission and are available with standard or quarry body. A heated body which speeds the dumping operation during cold weather operation is available as optional equipment. Top speed with full payload is 32 mph.

Double reduction planetary type drive axle is mounted on free-floating springs and is positioned to the frame by swivel-connected longitudinal radius rods. This mounting permits movement of the springs in the spring brackets and avoids the leaf breakage caused by twisting on rough haul roads. The spring suspension provides for varying the spring contact centers according to the load — a longer, flexible spring for an empty unit and a short, rigid spring for heavy loads. This assures a smooth, comfortable ride and permits faster travel speeds on the loaded and return haul.

An air assist clutch, hydraulic booster steering, and driver's seat that is fully adjustable for weight and position also contribute to ease of operation and driver comfort. More information may be obtained by requesting Form No. 121 from the company at the address above.

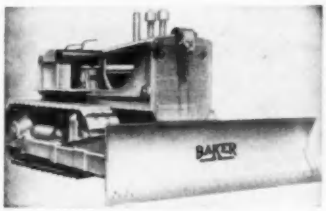
and up. Removable Cyclo-Center eliminates the need for a wood template to start holes. When inserted, it accurately locates and starts a hole. As soon as hole is spotted the insert is removed. This accessory also prevents walking of the bit or marring of the surface being drilled.

Machined-in spiral threads running the full length of the body make automatic runways for removing dust from the hole as it is cut. Each bit has a port opening for cleaning out the core.

Cable Bulldozer

Manufacturer: Baker Manufacturing Co., Springfield, Ill.

Claims: Redesign of cable-control mountings for the new Baker line of bulldozers, gradebuilders and root rippers. The new cable models are for the Allis-Chalmers HD-9, HD-15 and HD-20 tractors. Redesign of the cable-control mounting provides better visibility. Cable itself is routed under fender, close to the side of the tractor for better protection.



The built-in radiator guard with perforated grill is an integral part of the cable frame. Quick, easy interchangeability between dozer, gradebuilder and root ripper is provided by removal of a bolt on each side, removal of wedges and detachment of the lower sheave block at the front.

Anti-Rust Paint

Manufacturer: Paint Corp. of America, Cleveland, O.

Claims: Suitable for both interior and exterior use, the new paint—called PCA-100—is reputed to be equally effective in preventing rust on new metal or stopping rust action on present rusted metal. The manufacturer advises that it can be applied right over rust without extensive surface preparation such as wire brushing, scraping or sand blasting. Upon application, it penetrates through the rust layer into the base metal and seals the surface against further rusting. The paint is suitable for either brush or spray application. PCA-100 is furnished in black only and, due to its penetrating characteristics, should be used solely

Continued on page 48

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Missouri Highway Job Proves

BIG RED TEAM

LOOK at these figures on a big Missouri highway job with a haul distance of 2350 feet one way. Just as on similar jobs throughout the country, the Big Red Team of Bucyrus-Erie Scraper and International TD-24 Tractor outperformed comparable size competitive units on every count — yardage, loading speed, dumping speed, overall cycle time.

Equipment	Struck Capacity (cu. yd.)	Average Load* (cu. yd.)	Average Loading Time	Average Dumping Time	Average Cycle Time	Cu. yd. per hr.
Big Red Team Of B-250 Scraper and TD-24 Tractor	22	19.9	75 sec.	33 sec.	12 min. 46 sec.	87
Tractor-Scraper Combination X	18.7	13.9	77 sec.	65 sec.	16 min. 30 sec.	51
Tractor-Scraper Combination X¹	18.7	13.9	80 sec.	70 sec.	15 min. 11 sec.	55

*Determined by weighing scrapers before and after loading.

Note: Both scraper X and X¹ were identical make scrapers pulled by identical make tractors. In figuring cycle time and hourly production, actual operating time was used — unproductive time was not considered.

Here the Big Red Team piles up yardage on the Missouri highway job noted above. It's big, rugged and ready to prove its ability on your job.

WINS ON EVERY COUNT

Here's What Those Facts Really Show!

1 The B-250 with 3.3 yd. greater capacity than either competitive scraper averaged 6 yd. larger loads — carried 32 and 36 more yards per hour respectively than the competitive units.

2 The B-250, even with a payload 6 yd. greater, loaded faster and dumped in half the time of the competitive units.

3 The B-250 covering the same 2350-ft. one way haul distance as the two competitive outfits, completed the load-travel-dump-return cycle in an average of 23% and 16% less time respectively than the competitive units.

Dumps Faster

Loads Faster

Loads Bigger

Hauls Faster

Facts speak for themselves — and this is no isolated example. We have a variety of such case histories on record. Verify them by asking your International Industrial Tractor Distributor for a demonstration on your own job. Watch the Big Red Team outperform other crawler-scraper combinations — outperform rubber-tired outfits on much longer hauls than has been generally accepted.

247TBIC

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

See Your
International Industrial Tractor Distributor

NOT in the *Contract*

Wife: "How helpless you men are! What would you do if there were no women to sew on your buttons for you?"

Husband: "Has it occurred to you, my dear, that if there were no women that we men would need no buttons?"

The freshman's father paid his son a surprise visit. Arriving at 1 a. m., he banged on the fraternity house door. A voice from the second floor yelled, "Whatdya want?"

The father answered, "Does Joe Jones live here?"

The voice answered, "Yeah, bring him in."

Brooklynite: "What did you do in civilian life?"

Buddy: "Worked in Des Moines."

Brooklynite: "Coal or iron?"

A French undersecretary was invited to the silver wedding anniversary of a distinguished English bishop. "Silver wedding?" he asked the bishop's nephew. "It is a ceremony which I do not quite grasp."

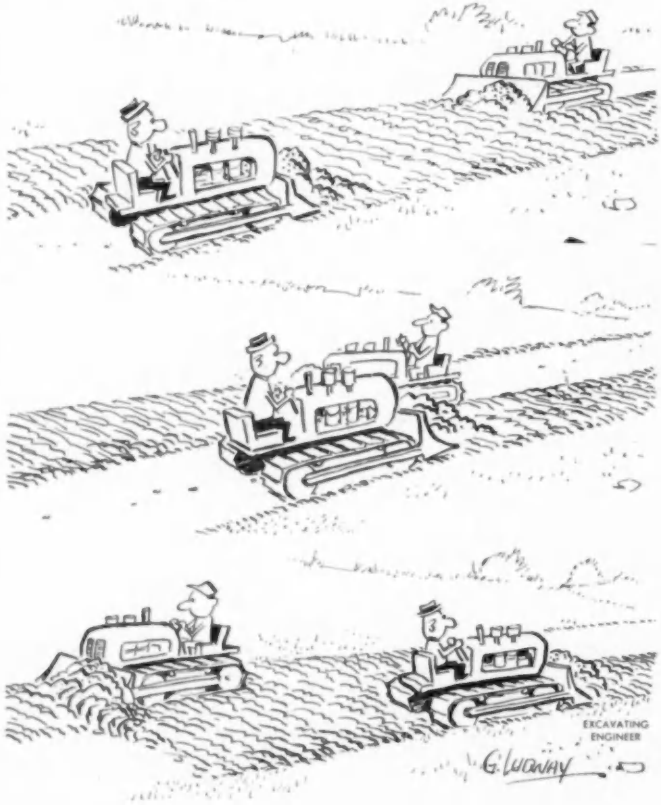
"My uncle and aunt," was the reply, "have lived together for twenty-five long years without being separated a single day."

"Ah!" said the Frenchman. "And now he marry her? Magnifique!"

A race track habitue told his wife: "The darnedest thing happened to me at Jamaica this afternoon. I was bending down to tie my shoe-lace and some near-sighted goon slapped a saddle on me."

"What did you do?" asked the wife.

"What could I do?" complained the husband. "I came in third."



A lady bought a parrot from a pet store, only to learn that it cursed every time it said anything. She put up with it as long as she could, but finally one day she lost her patience.

"If I ever hear you curse again," she declared, "I'll wring your neck."

A few minutes later, she remarked rather casually that it was a fine day. Whereupon the parrot said, "It's a hell of a fine day today." The lady immediately took the parrot by the head and spun him around in the air until he was almost dead.

"Now then," she said, "It's a fine day today, isn't it?"

"Fine day!" sputtered the parrot. "Where the hell were you when the cyclone struck?"

First Gal: "I bet that new roomer was embarrassed when you caught him looking over the transom."

Second Gal: "He certainly was. I thought he never would get over it."

"Daddy, why do the ladies always bring their knitting when they come to the house?"

"It gives them something to think about while they're talking."

First Private: "Why did you salute that truck driver?"

Second Rookie: "Don't be so dumb. That's no truck driver; that's General Hauling. Don't you see that sign?"

Bus Driver: "All right, back there?"

Feminine Voice: "No, wait 'till I get my clothes on."

So the driver led the stampede to the rear and watched a girl get on with a basket of laundry.

We understand that manufacturers of a certain feminine garment are currently making only three kinds: the Russian type, the Salvation Army type, and the American type. The function of the Russian type is to uplift the masses; the function of the Salvation Army type is to raise the fallen; the function of the American type is to make mountains out of molehills.

If you think you're going to be happy and prosperous by sitting back and letting the government take care of you — look at the American Indian.

Bottom-Dump Euclids receive heaping loads in less than 40 seconds.

"EUCS" Rush Road To Hydrogen Bomb Plant

Hauling an 18 cu. yd. payload of sandy clay.

Construction of a four-lane highway 24 miles long—an access road to a Hydrogen Bomb Plant site in South Carolina—is another rush project where Euclid speed, capacity and dependability paid off.

Fourteen Bottom-Dump "Eucs" of 13 cu. yd. struck capacity and a Euclid Loader enabled contractor R. B. Potashnick to complete this big earth moving job ahead of schedule. Seven of the Bottom-Dumps were used under the Loader; the remaining "Eucs" were loaded by 3½ yd. and 2½ yd. draglines. Some of the units were equipped with top extensions to accommodate heaping loads of 16 and 18 cu. yds.

The job required moving 1,925,000 cu. yds. of sand and clay on hauls averaging 900 feet, up six per cent grades. Euclid staying power and continuous operation were important factors in getting the job done on time.

Your Euclid Distributor will be glad to provide helpful information and discuss your present or future earth moving requirements.

The EUCLID ROAD MACHINERY CO.
CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID CODE: BENTLEY

MORE LOADS PER HOUR— MORE PROFIT PER LOAD

EUCLIDS *Move the Earth*

New Equipment

Continued from page 43

as a "finish" coat. A companion product, PCA-101 is a clear paint, equally effective for rust prevention, and can be painted over with any standard paint of any color.

Cotton Sweatband

Manufacturer: General Scientific Equipment Co., Philadelphia 2, Pa.

Claims: Expanded cotton sweatband produced by a special process from cotton-backed gauze expanded to about eight times its normal thickness, making all its fibres absorb perspiration fast; soft and light, no metal parts to rust or chafe, only pure cotton touches the head. Strong enough to stand repeated rinsings and re-use.

FM Radiophone

Manufacturer: Motorola, 4545 W. Augusta Blvd., Chicago 51, Ill.

Claims: A new version of the portable FM radiophone that incorporates an adjustable squelch is being introduced by Motorola.

The squelch reduces the annoyance of tube and circuit noises normally encountered in an FM receiver in the absence of a signal.

The squelch control, mounted on the power supply chassis, provides a normal operating range of no-squelch up to 25 to 50 db noise reduction.

Any possible audio distortion resulting from the portables being used in fringe areas is eliminated as a result of the addition of the adjustable squelch.

The Handle-Talkie portables are available with either wet or dry cell power supplies for operation in either the 25-50 megacycle or the 152-174 megacycle bands.

Low Speed Tractor

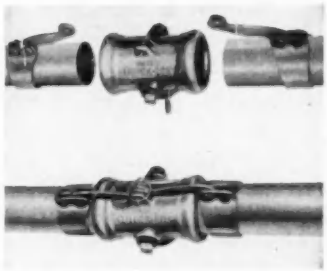
Manufacturer: Caterpillar Tractor Co., Peoria 8, Ill.

Claims: A low speed gear group to improve tractor-scraper performance for the manufacturer's tractors, especially in pusher-loading earthmoving operations is now being manufactured. The new gear permits DW10 tractors to operate at lower speeds for better synchronization with the speeds of pusher track-type tractors in pusher-loading scraper operations. First gear speed of the tractors is reduced from 2.8 mph with the new gear group. Second gear speed of Cat D8 track-type pusher is 2.3 mph and the D7, 2.2 mph. These matching operating speeds between pusher tractor and tractor-scraper unit, result in better loading efficiency. The low speed gear group also provides a greater potential tractive effort for self-loading operations. The remainder of the forward and reverse gears of the low speed gear group are the same as the standard group.

Quick Coupler for Pipe Lines

Manufacturer: R. M. Wade & Co., Portland, Ore.

Claims: A new pipe coupler that is designed especially for industrial use and promises important savings in time and manpower to the construction field, mines and industries was recently perfected. Because the new coupler permits fast setting up and moving of pipe lines from one job to another, it is expected by the manufacturers to have a particularly important place in construction operations, for handling both air and water under pressure. Easy-access outlets for connecting air lines, lateral hoses, etc., are provided on each coupler for running hose and other lines. The new "Quick-Lok" coupler can be used for oil or gas lines, chemicals or fuel oils, as well as for air and water at high pressures and for use on



"I know it sounds silly, but I smell Mulligan stew."

Mechanical soldiers need good shoes, too!

THESE are days of grave concerns . . . of conservation and mobilization for strengthening the nation's defense—for the survival of our national economy—for the continuance of useful highway, airfield, dam-site, reclamation and other construction programs—for the keeping of every home-front machine in condition to stay on the job until its replacement again becomes a normal procedure.

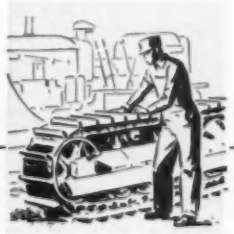
That includes *your* equipment and emphasizes *your* responsibilities. To benefit fully from the productive life that has been built into your "Caterpillar" equipment, you must be alert to its needs as time and hard usage take their toll in wear and depreciation. For instance:

How are your "Caterpillar" track shoes?

Tough as they are, they can't battle rocks, shale, jolts and grinds forever. Growing shortages in the premium steels that go into them may make early replacements difficult—and extra care of track parts something to think about.

CATERPILLAR, PEORIA, ILLINOIS

DO THIS NOW



YOU'RE THE DOCTOR. Check those sprockets, grousers, rollers, idlers, pins, links and bushings. Proper track adjustment minimizes wear. Sprockets may need switching from side to side, and pins and bushings need turning, to provide new wearing surfaces. Shoes serve longer if you have worn grousers built up before excessive wear occurs.

Reread your Operator's Instruction Book. Anticipate your future parts requirements. Take the facts to your "Caterpillar" dealer. His modern facilities and skilled servicemen are at your disposal. He can rebuild many parts to keep your machines on the job. Their added life will repay the reconditioning cost over and over.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

a line to run a riveting gun on a bridge job, or in a mine for drilling.

Among the features listed for the new coupler are: positive manual lock with safety feature, connect and disconnect without tools, tested to handle 300 pounds per square inch, couplers are made of aluminum alloy, and special Loks-in gasket assures positive sealing under operating pressures. Two styles of gaskets are available — one self-draining, the second, not self-draining. The self-draining feature is especially important where lines are moved frequently. Coupler is separate from pipe.

The new coupler is built for plain end pipe; rolled, welded or formed ends are not needed. A damaged end does not mean loss of a length of pipe or a welding job; just cut off the end, replace the ring and lock bar, and the coupler handles the connection.

Pile Hammer

Manufacturer: McKiernan-Terry Corp., 15 Park Row, N. Y. 38, N. Y.

Claims: New size and model of double-acting pile hammer. The new hammer, known as the No. 6.5, was designed primarily for driving steel sheet piling in close quarters. It is capable of driving one pile between two adjacent sheets, and can be used for driving in sand. It normally operates at 280 blows per minute, with an energy of 3,200 foot-pounds per blow, and is suitable for 8-in. to 15-in. steel sheet piling or 6-in. by 12-in. wood sheeting of the equivalent size of round timber piles. Further information on the new hammer can be obtained by contacting the company, Dept. 109, and asking for Bulletin 58-A.

DREDGES

HYDRAULIC DIPPER CLAMSHELL

Bolted sectional steel hulls for landlocked, inland waters

If you need a dredge, write us!

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

Heavy-Duty Boom

Manufacturer: Schield Bantam Co., Waverly, Iowa.

Claims: Available in 25-ft. length, with 5-ft. extensions, a new boom is offered for the manufacturer's 5-ton truck-mounted Bantam shovel-crane. Heavier reinforcing and bracing are features along with braces along the lower section for protecting boom when dropped or bumped against other objects. The new boom is especially adaptable for logging operations, pipe handling, steel erection, industrial materials handling, etc. The crane is said to be conservatively rated at 10,000 lbs. capacity at 10 feet with outriggers and 1,000 lb. counterweight.

Crawler Tractor

Manufacturer: American Tractor Corp., Churubusco, Ind.

Claims: A versatile new crawler tractor called the GT 30 Terratrac is being introduced by the manufacturer. This multi-purpose tractor is powered by the four-cylinder Continental F-140 engine and includes other well known standard parts. It is designed for a wide range of construction and industrial applications. When fully equipped with hydraulically activated bulldozer and angle dozer, the GT 30 weighs less than 4,400 pounds. Special rubber track shoes have been developed for this tractor, permitting it to take advantage of its 4.98 mph third speed. These shoes increase the uses of the GT 30 and its speeds for indoor operations on cement or wood floors, as well as on all types of highways.

In addition to the bulldozer and angle dozer, hydraulically operated attachments include bucket loaders, winches, scoops and others. Of special interest is a three-point hydraulic lift system for rear mounted tools.

Air Compressor

Manufacturer: Schramm, Inc., West Chester, Pa.

Claims: A new compressor known as the 210 Unistage has been added to the manufacturer's line. Featuring air

delivery of 210 fpm, the 6-cylinder engine and 6-cylinder compressor unit is designed for continuous heavy-duty 24-hour service.

One of the features of the compressor is the fact that 90% of the engine parts are interchangeable with the compressor. This simplified design eliminates two-staging and inter-coolers, also requires fewer parts. Among the additional features are pneumastat fuel control, electric starting, speed control, cam operated mechanical intake valves and dual fan belts.

Air Conditioner

Manufacturer: Dravo Corp., Pittsburgh 25, Pa.

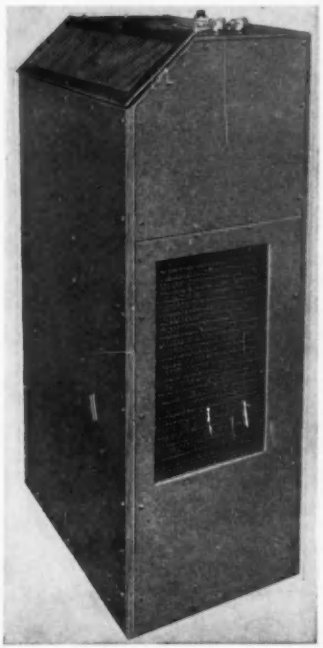
Claims: Equipment for air conditioning the cabs of cranes operating in high temperatures or in atmospheres contaminated by toxic and noxious gases or dusts, has been developed. Known as the Split-Type Crane Cab Cooler, no ductwork is needed for installation because the cooling section is installed in the cab itself and the larger condenser section is placed outside on the crane in any convenient location.

The cooling section, which goes into the cab, is housed in an aluminum

finish cabinet. There is ample room for the unit in most crane cabs. The only connections between it and the

condenser unit outside the cab are power lines and refrigerant piping.

Thermostatically controlled, the split-type crane cab cooler will maintain a temperature of 80° to 85° F. when the outside ambient temperature is 175°.



During the heating cycle, the unit keeps the temperature in the cab at 68° to 75° with an ambient temperature of zero outside.

Units are compactly enclosed in cabinets which give added protection from various types of dust. Additional information may be obtained by writing manufacturer.

NOW 1 machine does the work of 3

New Bantam® Back Hoe with Crane Adaptor and Backfill Blade

- Eliminates need for extra work crews!
- Saves bringing in costly 1-purpose rigs!

Digs 100′ of 5′ trench per hr.

New truck-mounted Bantam Back Hoe goes anywhere fast . . . opens trenches and other excavations to depths of 14 ft. Leaves trench bottom flat . . . sides straight, without need for hand trim. Three optional bucket widths — 20", 25" and 30" — with choice of solid or basket-type buckets for handling various materials.

Hoists 2½ ton loads

Simple Bantam Crane Adaptor quickly converts Bantam Hoe to 2½ ton crane (less outriggers or counterweights) in a few minutes on the job. Utilizes same boom, same stick — and same one-man operation — for economical spotting of gas, oil, water or sewer pipe. Also cuts cost of placing tanks, culverts . . . speeds loading and unloading materials from trucks without special equipment.

Backfills 350′ of trench per hr.

With trench opened and pipe in place, operator simply hooks on fast-change Bantam backfill blade . . . covers trench in a jiffy . . . moves on to next job. Big 5′ x 2′ Bantam backfill blade has maximum reach of 23½′ . . . works to within 6½′ of center of machine rotation . . . remains perpendicular to ground at all times for fast "dozing" action.

Write for details

SCHIELD BANTAM COMPANY

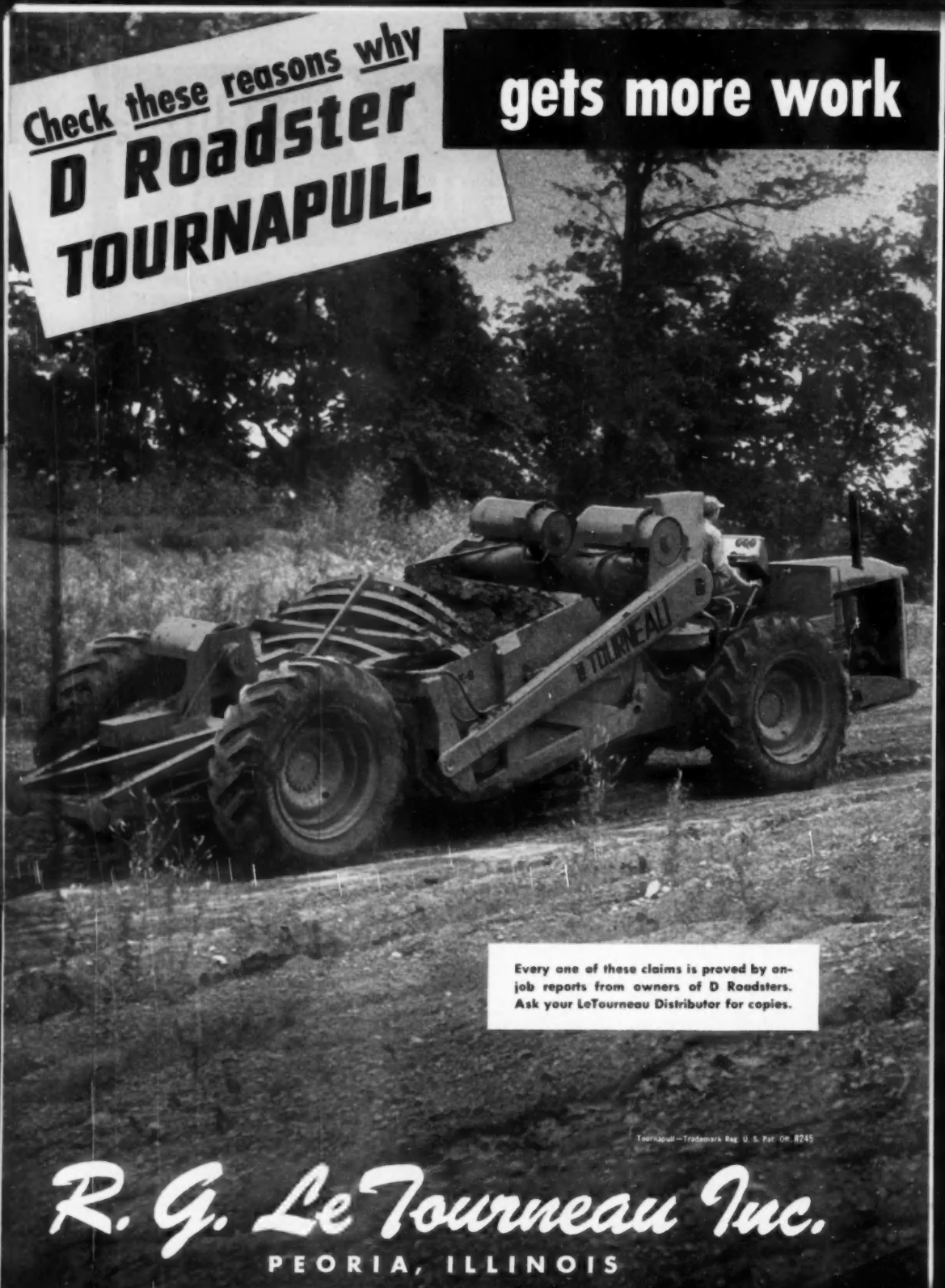
202 Park St., Waverly, Ia., U.S.A.

58 C-13

SCHIELD BANTAM

Costs less . . . goes anywhere fast

GETS MORE JOBS DONE


Check these reasons why
D Roadster
TOURNAPULL
gets more work
TOURNEAU
Every one of these claims is proved by on-job reports from owners of D Roadsters. Ask your LeTourneau Distributor for copies.
Tournapull—Trademark Reg. U. S. Pat. Off. #245
R. G. LeTourneau Inc.
PEORIA, ILLINOIS

done at a lower net cost per job

1 Modern rubber-tired speeds for fast digging and quick moves

This fast-stepping unit has a top speed of 28 m.p.h. You shift gears fast through the 5-speed, heavy-duty, sliding-gear transmission; has positive electric steer for accurate control and snappy maneuvering. You get big, fast tires instead of a crawler's tracks. With "D's" 28 m.p.h. high speed, you get definite production and cost advantages on *both* long or short hauls as well as on odd-job and production assignments.

2 Less downtime for weather, less slowdown for soft and slippery going

Big, low-pressure tires improve traction. Two-wheel prime mover wastes no tractive weight on extra steering wheels. Power-proportioning differential applies up to 4 times more power on wheel having firmest footing. Positive power steer shifts footing as needed for a better pull. All these speed up work cycles, cut downtime for bad weather.

3 Easier to keep busy, handles odd jobs or production dirtmoving

7-yard D Roadster is ready to go anytime at 28 m.p.h. to handle scattered one-machine jobs such as back-sloping, clearing slides and other small-yardage jobs. It also is an effective big-yardage dirtmover when pusher-loaded in fleet operation. This flexibility gives you more effective use of manpower and equipment for your maintenance and construction operations. Both a Snow Plow and Bulldozer blade increase year-round application and make it most profitable tool in your equipment inventory.

4 You save on job-to-job travel over pavement . . . cross country

Your operator drives the Roadster job-to-job over the highway under its own power (and carrying its own supplies). This saves cost of loading, blocking, trucking, low-boy, unloading, plus wasted waiting time. In addition, because the "D" can work-and-run to another one-machine assignment any time, any place, you can speed up maintenance service on your jobs or anywhere around the country . . . any time of year. 25 miles is only about an hour away. Unlike crawler's tracks, big rubber tires do not damage road surface.

5 Faster, easier to operate . . . less fatigue

Good operators are always available for the D Roadster. Push-button electric control makes it faster and easier to control. Big, low-pressure tires, air foam cushioned seat, plus quieter operation eliminate a lot of operator fatigue. This makes for safer, faster, steadier operation, less manpower turn-over. These advantages plus better operator co-operation mean a substantial increase in yards moved and more jobs completed throughout the year. Contact your LeTourneau Distributor for all the facts . . . there's no obligation.

Attachments and interchangeable EQUIPMENT:

7-TON CRANE

V-TYPE SNOW PLOW

BULLDOZER BLADE

REAR-DUMP HAULER

Send for complete facts to: R. G. LeTOURNEAU, INC., Peoria, Illinois

Please send us: ☐ Specifications ☐ Job performance reports on 7-yd., 28 m.p.h. D Tournapull

Name..... Title.....

Company..... Street.....

City..... State.....

Also interested in D Tournapull for use with: ☐ V-Type Snow Plow ☐ Bulldozer ☐ Rear-Dump Hauler ☐ 7-ton Crane

LeTOURNEAU LET EQUIPMENT

2300 Miles

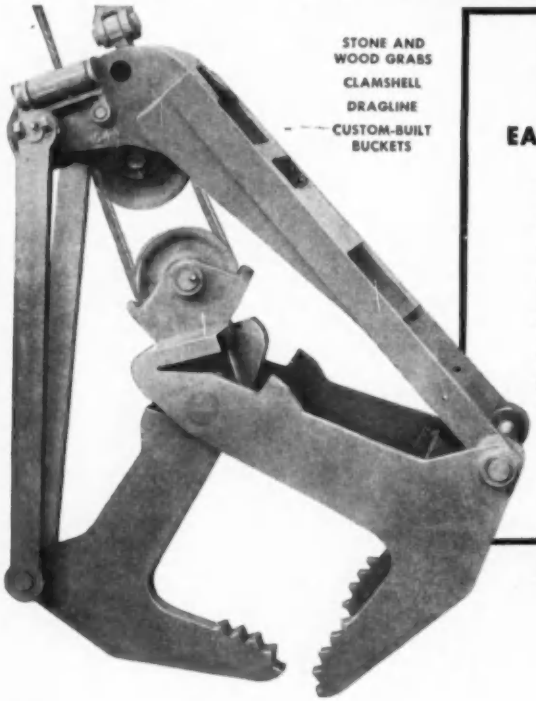
Continued from page 18

world is mainly by airplane. The company has built an airfield at San Felix, 2½ miles from Palua, which it maintains for daily use by commercial airlines. Puerto de Hierro has daily connection by means of company launches, free to all, with nearby Guiria and its adjoining airfield.

The problem of providing housing and other facilities for this number of men in completely undeveloped areas was one of major proportions. The first shelters were necessarily improvised and rather primitive. Today, however, the three communities offer adequate living quarters for all.

Water of excellent quality is furnished in sufficient quantity to satisfy the need of any community of equal size. El Pao gets its supply from the Caroni River, pumped through a 23-mile, 8-in. pipe line to a reservoir of 11 million gallon capacity. A local spring also feeds the reservoir. Palua draws water from the Orinoco, and Puerto de Hierro from a dammed-up mountain stream three miles away. All water passes through modern treatment plants before it is distributed.

• Top: Most staff houses have been erected by Bethlehem Steel Co. in jungle clearings, like this at El Pao. Bottom: Venezuela chooses, steel company pays for schools and teachers.



STONE AND WOOD GRABS
CLAMSHELL
DRAGLINE
CUSTOM-BUILT BUCKETS

WELLMAN

EASY HANDLING OF LARGE STONES

• Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts? Send for free descriptive bulletins.

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

Parking Garage

Continued from page 25

make another circle around the perimeter, drilling nine feet from the first round. Finally the third 9-ft. center is drilled, disturbing the ground as little as possible. There is no marked weakness differential in original soil when the holes are drilled in this manner. The method, which was designed by Stiles Clements, associated architects and engineers, is proving especially successful, and has saved untold pounds of steel sheet piling which might otherwise be necessary to hold the bank.

Placing of the 55,000 yards of reinforced concrete is expected to follow conventional methods. The columns, ramps and walls are not extraordinarily heavy, and forming will be routine. Commercial transit mixed concrete will be hauled in, the pours will be made and stripped, and by 1953 the garage should be ready for use. The main storage floors will be steel-reinforced concrete slabs six inches thick, while the roof will be a 9-in. slab. About 30,000 yards of topsoil will be hauled back in from stockpile, and placed over the structure. The park which is planned to replace the old one will be even more beautiful, and once again Pershing Square will be a landmark and citizens' mecca in the heart of Los Angeles.

Stretch Harbor

Continued from page 30

groups of eight and were fired with electric caps and Primacord. Excellent results were obtained with these demolition charges, but before the job was fairly begun the supply was found to be exhausted. A quick canvass of the jobbers and powder companies revealed that no more were to be had at the time, so substitute charges were made up on the job, using 60% Pacific gelatin tied in bundles of 2½ to 3 pounds each. These were fired in exactly the same way as had been the T.N.T. blocks and were found to be equally effective.

A total of 120 shots was detonated to remove 400 yards of lava rock from the channel bed and lower it to the specified depth of minus eight. Not a big job measured by conventional yardsticks perhaps, but under the prevailing conditions certainly a challenging one.

THE RED U-BOLT TELLS YOU

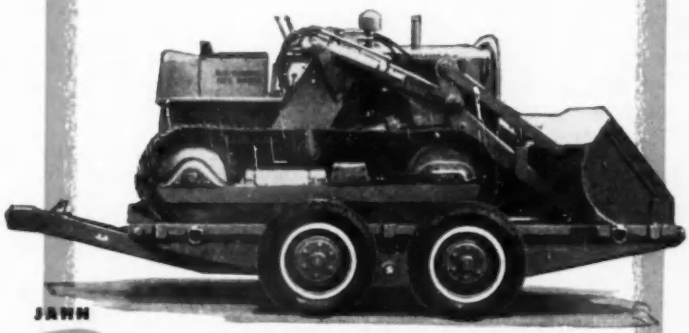
1 They're drop-forged
2 Hot dip galvanized
3 They're genuine

CROSBY CLIPS

4 They're America's largest-selling DROP-FORGED WIRE ROPE FASTENERS
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

F.O.B. NEXT JOB



JAHN PSC TRAILERS

JAHN TRAILER DIVISION
Pressed Steel Car Company, Inc.
6 North Michigan Avenue, Chicago 2, Illinois

Just tilt the trailer bed, load, and you're on your way to the next profitable job. With a Jahn Tilt Trailer, you can move your tractors, rollers, etc. *where* you want them, *when* you want to, and with the *safety* you demand. For moving five tons or a hundred, you can't beat Jahn Trailers.

THERE'S A JAHN TRAILER FOR EVERY HAULING NEED

Tandem Axle Trailers

Tandem Axle Tilt Trailers

Single Axle Trailers

New trade literature

Title: **More Miles Out of Truck Tires**
Subject: A new eight page booklet containing information on subject was recently released. Nine methods to have tires provide their maximum services are covered under the following headings: proper selection of tire for the job; correct inflation; correct loading and load distribution; correction of mechanical defects; proper care of tubes; regular rotation of tires; proper matching and spacing of duals; savings through recapping and repairing; and proper driving habits. Text of each of the subjects is short, informative and illustrated. A truck tire load and inflation table and a dual spacing table are among the features.
Where to Get: B. F. Goodrich Co., Akron, O.

Title: **Symposium on Soils**
Subject: The five papers and discussions comprising this publication were sponsored by ASTM Committee D-18 on Soils for Engineering Purposes and presented at the 1950 annual meeting of the American Society for Testing Materials. The intent of this symposium is to depict the most widely employed procedures in current use for identifying and classifying soils for engineering purposes. The authors of the papers are particularly well qualified on this subject through many years of experience with the individual system of identification and classification that they describe. Papers included are: Identification and Classification of Soils—An Appraisal and Statement of Principles, A Standard Classification of Soils as Proposed by the Bureau of Reclamation, Discussion of the Classification of Highway Sub-grade Materials Initiated by the Highway Research Board, Soil Classification for Highway Purposes and Soil Series Names as a Basis for Interpretive Soil Classifications for Engineering Purposes.
Where to Get: American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. (STP113, $1.65)

Title: **Lefax Mathematical Tables**
Subject: A newly revised 176 page loose leaf data book containing mathematical tables and formulae needed to solve problems in arithmetic, geometry, algebra, trigonometry, analytical geometry and calculus. The material is conveniently arranged in six thumb-indexed sections for ready reference. Sections are: mathematical reviews; squares, cubes, square roots, cube roots, reciprocals, areas and circumferences, etc.; five-place logarithms of numbers; five-place logarithms of trigonometric functions; five-place natural trig functions; and hyperbolic functions. ($1.50) Publisher also offers catalog giving over 2,000 listings of technical data books in convenient pocket size, free.
Where to Get: Lefax Publishers, Philadelphia 7, Pa.

Title: **The Right Rope for the Job**
Subject: A 42-page wire recommendation book is now available. The two color book has short sections giving rope specifications for such uses as construction, dredging, logging, mining, wells, miscellaneous industrial and others. Each section has pictures which help to describe various rope uses. Also included is a page of cutaway drawings of rope ends and specifications on the manufacturer's product.
Where to Get: American Steel and Wire Co., Rockefeller Bldg., Cleveland 13, O.

Title: **Discussion of Crushed Stone Operating Problems**
Subject: Transcript of the operating sessions of the National Crushed Stone Association and Agricultural Limestone Institute Annual Conventions held in Cincinnati during the week of Feb. 7, 1951. There is practical information on a wide variety of subjects contained in this publication and should prove helpful to crushed stone men and machinery and equipment manufacturers.
Where to Get: N. C. S. Assoc., A. L. Inst., 1415 Elliot Pl., N. W., Washington 7, D. C. (75c)

Title: **Carbon Brushes**
Subject: Designated as publication GEA-5597, the 28-page bulletin describes and illustrates the fundamental considerations given to the design, application, and manufacture of carbon brushes and includes a section on brush terminology. Produced to familiarize users with the physical characteristics that must be known before proper recommendation can be made for a brush application, the booklet also tells of the engineering services offered by G. E. to help solve specific brush problems. Included are sections on types of brushes, characteristics of brush grades, brush grade recommendations, mechanical design of brushes, and tips on brush replacement.
Where to Get: General Electric Co., Schenectady 5, N. Y.

Title: **Heavy-Duty Autocars in Construction Field**
Subject: A new six page folder, depicting the part played in construction by the manufacturer's heavy-duty trucks and highway tractors, the first in a series of six covering different industries. The folder cites the advantages of complete heavy-duty trucking equipment in such operations as hauling stone, ready-mixed concrete, brick, steel, lumber and machinery. Booklet displays pictures of equipment engaged in 14 different operations of the construction industry—homes, factories, highways, dams, etc.
Where to Get: Autocar Co., Ardmore, Pa.

Title: **Series on Diesels**
Subject: Four two page folders presenting operating and construction features of International diesel engines are being distributed. These folders offer detailed information on reserve torque control, all-weather gasoline conversion starting, combustion control, and long-life lubrication. The titles and form numbers of these folders are: Long-Life Lubrication, CR-131-A; Combustion Control for Economical Power, CR-132-A; Fast All-Weather Starts, CR-130-A; and Pull Through Overloads, CR-133-A.
Where to Get: International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Title: **Hose Fittings**
Subject: Bulletin H-1200-B44—the first in a series to supersede the Blue Brute Accessories Catalog—shows line of hose fittings, including sizes, parts numbers and applications. Fittings illustrated are hose nipple, union nut, hose clamp, coupling spud, reducing coupling spud, spud, reducing spud, threaded pipe nipple, hose valve and splicing nipple.
Where to Get: Worthington Pump and Machinery Corp., Dunellen, N. J.

Title: **Manual on Hydraulic Control**
Subject: A pocket-sized guide on the operation and care of the hydraulic control of P&H power cranes and shovels. The 28-page booklet contains complete information on the

FOR EXTRA SMOOTHNESS

IN ROCK

WARD-LEONARD

MARION 93-M ELECTRIC

The new MARION 93-M Ward-Leonard Electric shovel digs rock with smoothness you'd never expect from a 2½-3 cu. yd. machine.

There's no jerking—no hesitating—no "stuttering" when the dipper comes up through a rock pile. There is power to spare, applied so smoothly that there is no machine strain or breakage.

This is the kind of smoothness that pays off in longer machine life, greater daily yardage and greater dependability.

From its long, wide, steady crawlers to the big, reversible dipper teeth, here is a MARION designed and built for service in rock digging.

The 93-M is built to MARION standards of quality that mean year-after-year dependability and true, long-range economy. It is backed by 66 years of shovel design and manufacturing experience.

Call your nearest MARION representative, or write to the factory.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

hydraulic control system and describes the correct procedure for dismantling, adjusting and replacing parts. Identification of parts is made easy by the use of numerous keyed photographs and cutaway drawings. A 4-page "foldout" diagrammatic illustration shows the entire hydraulic system.
Where to get: Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. (Free)

Title: **Dependable Service**
Subject: Booklet of importance to Caterpillar equipment owners. Illustrated booklet discusses the importance of service to equipment owners, service facilities, and location of dealer's stores.
Where to Get: Caterpillar Tractor Co., Peoria 8, Ill. (Free)

Title: **Dragline Buckets Catalog**
Subject: An eight page catalog No. 188 illustrates and gives specifications for all five types of Esco dragline buckets. Described are the featherweight, medium weight, heavy duty (standard), extra heavy duty (under water mining) and stripping dragline buckets. Specifications are given in detail and are illustrated with a model view of the representative bucket. Recommendations are given with each set of specifications.
Where to Get: Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore.

Title: **Diesels Producing Coal**
Subject: Forty-two illustrations of Cummins diesels at work in the nation's coal fields in various applications are displayed in an 8-page leaflet. Case histories of typical examples of diesels' application in the coal industry are grouped into three major headings: stripping and loading, hauling and stationary power. Transporting is divided into three parts: on highway, on rail and on water. The back cover is devoted to specifications for hauling, loading and stripping, and for industrial power.
Where to get: Cummins Engine Co., Inc., Columbus, Ind. (Free)

Title: **Tractor Equipment**
Subject: Catalog covering the complete line of Trackson tractor equipment. Products described and illustrated include the tractor-shovel teammates of matching diesel tractors. All sizes are shown. Other machines illustrated and described include pipe layers, earth augurs, Trac-Loaders, swing cranes and land clearing equipment. Specifications are included for each unit.
Where to get: Trackson Co., Milwaukee 1, Wis. (No. 1106-Free)

Title: **Bucket Loaders**
Subject: Bulletin covering Models 75, 77 and 75-SBC of Haiss bucket loaders. It has pictures of each model with detail drawings and a page of general specifications. There are also two pages of action pictures on various jobs loading stone, oyster shells, coal, and bank run sand and gravel, and a list of other available bulletins.
Where to Get: George Haiss Mfg. Co., Inc., 141st to 144th St., Park Ave., NYC 51.

Title: **Single Pass Gravel Plant**
Subject: Literature featuring a new single pass county gravel plant has been announced. Three plants with a capacity range from 20 to 65 tons per hour are included in the bulletin, called CP-1. A complete description of its applicability plus the basic units comprising the plant, the outstanding features and full specifications, are covered.
Where to Get: Diamond Iron Works, Inc., Minneapolis 11, Minn.

CUT DIGGING COSTS

with the new Sherman Power Digger

WRITE FOR LITERATURE TODAY!

Patented, actuated bucket gives you selective digging action, better loading, greater versatility.

All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

SPECIFICATIONS

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

Standard tractor mounting gives unmatched maneuverability and transportability.

•

Digs ditches, trenches, footings, culverts, basements and other excavations.

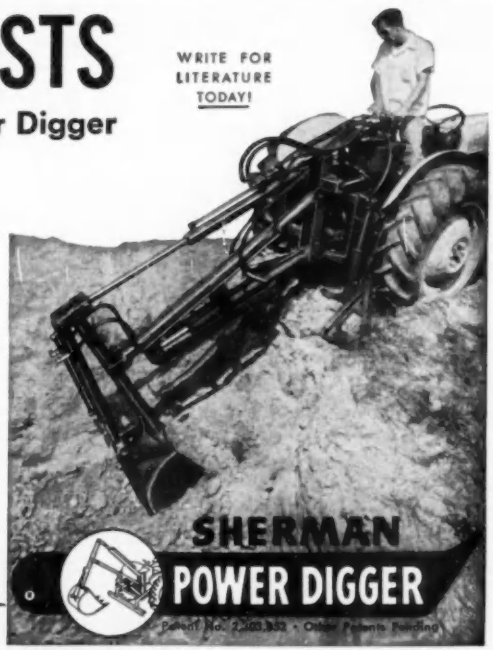
Works well behind the tractor at any angle.

•

Actuated bucket raises high enough to load standard dump truck.

•

Handles roots, rocks, hard clay and oiled road surfaces.



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SHERMAN PRODUCTS, INC. • Royal Oak, Michigan
WAIN-ROY CORP. • Hubbardston, Massachusetts
Sold Exclusively By SHERMAN PRODUCTS, INC.

SHERMAN PRODUCTS INC., Department No. 113 Royal Oak, Michigan

"One of the surest ways to make money is to save money..."

CAPTAIN EDDIE RICKENBACKER

President and General Manager
Eastern Air Lines, Inc.

"... and the purchase of U. S. Savings Bonds through the Payroll Savings Plan is an easy way to save. It is good for the community. It is good for you because it means money available for a rainy day. Through the thousands of years that men have roamed the globe there have always been rainy days."

A vigorous exponent of thrift, Captain Eddie Rickenbacker made the Payroll Savings Plan available to his employees of Eastern Air Lines some years ago. From time to time, in personally dictated letters addressed "To All Members of Eastern Air Lines Family", he points out the individual and national advantages of the Payroll Savings Plan, and urges members of Eastern Air Lines Family "... to sign up on the Automatic Payroll Savings Plan. In years to come I am sure you will be mighty glad you did."

How about *your* Payroll Savings Plan? What have you done since Savings Bonds became Defense Bonds? What is your percentage of employee participation?

From coast to coast, companies large and small are installing the Payroll Savings Plan or revitalizing their present plans through person-to-person canvasses which put a Payroll Savings Application Blank in the hands of every employee.

Note the results of some recent person-to-person canvasses. Think what management efforts like this mean to the Defense effort. Then phone, wire or write to Savings Bond Division, U. S. Treasury Department, Suite 700 Washington Building, Washington, D. C. Your State Director will be glad to help you put in a Payroll Plan or show you how to conduct a person-to-person canvass.

Results of recent person-to-person canvasses to increase participation in Payroll Savings

39 companies . . . total employees	487,347*
Employees on plan before canvass	81,481
Employees on plan after canvass	329,942
% of participation before canvass	16.8%
% of participation after canvass	67.7%
New savers added to plan	**248,461**

Based on National averages, employees in this group of companies are saving more than $7,000,000 every month in United States Defense Bonds.

**Includes 62,070 employees of six companies which did not have plan before canvass.*

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

Excavating Engineer

20 Million Yard Proof of Bucyrus-Erie Performance

Consistently high output regardless of weather or ground conditions makes Bucyrus-Erie walking draglines the choice for jobs like this twenty-million-yard channel improvement project in Louisiana.

One important reason is the exclusive Bucyrus-Erie walking mechanism for safe, smooth travel over soft or uneven ground. Others are strong, simple design and construction, assuring reliable performance when working in remote locations, and quickly responding controls for fast, efficient operation.

These outstanding features, backed by Bucyrus-Erie's unmatched manufacturing and engineering experience, add up to top-notch dragline service. The *years ahead* machines in the complete Bucyrus-Erie line provide a size to fit any job.

122L81C

BUCYRUS ERIE

This 200-W swings a 6-yd. bucket on a 110' boom, works round the clock on Louisiana's Bayou-LaFourche channel improvement project.

Bucyrus-Erie Company • SOUTH MILWAUKEE WISCONSIN

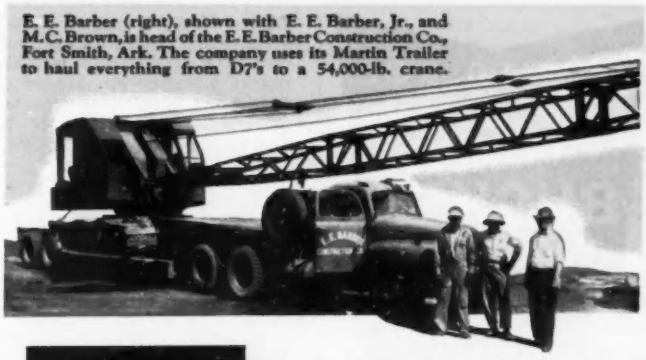
Notes from the manufacturers

Detroit Diesel Engine Div., GMC, Detroit, Mich., reports that during a two year period just ended over 8,000 engine owners and mechanics attended classes in diesel engine operation and maintenance offered by the division's three mobile training schools. The sessions were held in on-the-job locations at construction sites, mines, oil fields, lumbering camps and distributors' headquarters throughout the country. Each mobile school is transported by a truck carrying over four tons of training aids including cutaway and "live" engines, sub-assemblies, movies, charts and other equipment. Also announced by the division is the appointment of O'Connell Brothers, Inc., of Phoenix, distributors for Arizona. O'Connell Brothers have been located in Phoenix since 1919 and have represented United Motors Service since 1925. Additional outlets are to be established at Flagstaff, Safford and Tucson.

Worthington Pump and Machinery Corp., Harrison, N. J., has named former assistant sales manager A. F. Reinking, manager of the steam turbine sales division. Mr. Reinking will make his headquarters at the Wellsville plant. He is a mechanical engineer graduate from Rose Polytechnical Institute. He completed the Worthington student training course in 1927, and was assigned to the New York district office. In 1929 he joined the Moore Steam Turbine Corp., but again became associated with Worthington in 1936.

Pioneer Engineering Works, Minneapolis, Minn., has named Williams Tractor Co., Louisville, as Kentucky distributor for jaw crushers, roll crushers, feeders, screen, conveyors, complete rock and gravel plants both stationary and portable, and central-mix asphalt plants.

Hyster Co., Portland, Ore., has announced three changes in eastern division industrial truck and tractor equipment personnel. J. W. Morgan, for the past two years assistant sales manager, eastern tractor equipment division, Peoria, has been transferred to the industrial truck sales division and will be manager of the north central district with headquarters in



E. E. Barber (right), shown with E. E. Barber, Jr., and M. C. Brown, is head of the E. E. Barber Construction Co., Fort Smith, Ark. The company uses its Martin Trailer to haul everything from D7's to a 54,000-lb. crane.

SAVE... TIME IN LOADING-UNLOADING

ELIMINATE... DETOURS AROUND LOW CLEARANCES

HAUL... MORE PAYLOAD

WITH MARTIN "FOLDING GOOSENECK" TRAILER!

■ E. E. Barber, Fort Smith, Arkansas, says, "The Martin 'Folding Gooseneck' Trailer is superior to any trailer I've used or seen. It saves time in loading, its low height provides ample clearance, its weight allows more net load."

HOW THE MARTIN "FOLDING GOOSENECK" WORKS and SAVES

With safety locks unlatched, winch-equipped truck pulls away.

Gooseneck unfolds, forming a perfect ramp.

Truck winch lifts gooseneck and equipment into hauling position.

The "Folding Gooseneck" does away with the dangers and time of building loading and unloading ramps and blocking . . . low platform height carries equipment of every type under low bridges, wires and underpasses . . . rugged, all-welded, frame construction cuts dead weight and allows big loads to be carried within legal limits.

Martin "Folding Gooseneck" Trailers are the most modern answer to equipment hauling problems. Ask your Martin-"Caterpillar" Dealer about the size that can save on any haul for you. Do it today!

MARTIN MACHINE CO., Kewanee, Ill., U.S.A.

MARTIN Trailers

KEWANEE ILLINOIS, U.S.A.

HOW TO GET
Larger
BUCKET
PAYLOADS

This new Erie Catalog makes it possible to quickly choose, from the 4 classes of Erie 2-Line Buckets, the right bucket for *your* crane and material. Perhaps your crane can operate a larger bucket, for Erie alloy welded steel buckets result in greater payloads through scientific bucket weight reduction. Remember, that on bucket work, the cost of the crane and the operator all ride on the bucket. Send for this helpful catalog or outline your conditions and our engineers will make recommendations.

Write for Catalog **2L-1** *Today*

ERIE
STEEL CONSTRUCTION COMPANY
418 GEIST RD., ERIE, PA

Buffalo, N. Y. Donald R. Shaffer, north central district manager, succeeds John E. Mitchell as northeast district manager. Mr. Mitchell, a district manager for two years and formerly in the Chicago store has joined Field Machinery Co., Hyster dealer in Boston, Mass.

Joy Manufacturing Co., Pittsburgh, Pa., has announced the following new distributors: Missouri Valley Machinery Co. for an area covering 28 counties of northeastern Nebraska and 23 counties of eastern Iowa, Halsey-Reid Equipment, Inc., for a 7-county area surrounding Buffalo, New York, now located at 2065 Harlem Road, Buffalo, Davis-Hancock Machinery Co. of Dallas, Texas, G. W. Clements Equipment Co., 476 Avondale Ave., Columbus 8, Ohio, and Paving Supply and Equipment Co. of Washington, D. C., Baltimore and Salisbury, Md. Joy manufactures a line of construction equipment which includes air compressors, wagon and rock drills, pneumatic tools and portable hoists.

Coast Equipment Co., San Francisco, Calif., has been appointed exclusive sales and service representatives for the Eagle Iron Works of Des Moines, Iowa. The line consists of sand, gravel and ore washing equipment; breaker balls, drop pile hammers, line weights; and dredging ladders.

Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., announced the dump car, trail car and general car business which has been a part of the Austin-Western Co., Aurora, Ill., will be transferred to and operated from the Baldwin-Lima-Hamilton Corp., Eddystone, Pa. the change is scheduled to become effective on June 1, 1951. The dump car division of Austin-Western has manufactured cars for railroads and for open pit mining operations, steel mills, power plants, quarries and contractor organizations. The move which brings the engneering, manufacture and sale of dump cars to Eddystone is part of a plan to provide room for expansion of the motor grader operation at the Austin-Western plant in Aurora.

Air Reduction Sales Co., a division of Air Reduction Co., Inc., NYC, has announced the appointment of Edward H. Roper as manager of the general technical sales department. He joined Air Reduction in 1936, and served in various capacities in the department. In 1948, he became assistant manager of this department whose function it is to assist users of Airco products and processes in their proper applications. Mr. Roper received his Bachelor of Science degree in mechanical engineering from the Sheffield Scientific School, Yale University. He is a licensed engineer in the State of New York and for many years has been an active member of the American Society of Mechanical Engineers and the American Welding Society.

Four Wheel Drive Auto Co., Clintonville, Wis., Service Division, has announced the appointment of Bruce V. Walch as manager of the field service dept. Walch was formerly manager of the parts sales dept. He has been with the company since 1927. He attended Oshkosh, Wisconsin, State Teachers College for two years and then took advanced chemical analysis studies at Columbia University, New York, working, meanwhile, as an analytical chemist for the General Chemical Co. and the Standard Oil Co.

The Cleco Division of Reed Roller Bit Co., Houston, Texas has announced the appointment of the following distributors: The Ridley Co., San Francisco, Calif.; A. J. Baxter & Co., Detroit 7, Mich.; Gesner Equipment Corp., P. O. Box 472, New Haven 2, Conn.; Vogl Tool Co., Kansas City, Mo.; R. D. Price Assoc., Springfield, Mass.; Keystone Builders Supply Co., Inc., 85 Palm St., Rochester 13, N. Y.; Pit & Quarry Equipment Co., 3828 E. Washington St., Indianapolis, Ind.; Hays Supply Co., Memphis, Tenn.; Franklin Supply Co., 184 Broad St., Providence 3, R. I.; J. Heller & Sons, Inc., 149 Ferry St., Newark, N. J.; Someset Pneumatic, Inc.,

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date — 15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Used Bucyrus-Erie 320-B shovel. Good operating condition. Midwestern location. Inquire Box 3452 c/o Excavating Engineer.

Koehring 502 shovel-dragline. 1¾ yd. Hendrix bucket. New I.H.C. diesel motor. 90 feet of boom. Heavy-duty shovel front. Price $20,000.
International TD-24 with Bucyrus-Erie cable dozer and D.D.P.C.U. Price $17,500.
Bucyrus-Erie 22-B dragline. ¾-yd. Hendrix bucket. 40 ft. boom. I.H.C. diesel motor. Price $15,000.
All the above in excellent condition.

John Konsler
Henderson, Kentucky **Phone 5543**

H2 Hydrocrane, serial 1160, on I.H.C. truck with clamshell equipment. Reconditioned and located Grand Rapids. Price $3500. Box 3451.

Northwest 1¼ yd. dragline model 104, with 50 ft. boom, 1 yd. Page bucket. Traveling assembly, tracks, table, rollers, boom, sheaves, bucket in excellent condition. No further use in change of operations. $7000.

George M. Pendergast & Co., Milwaukee, Wis.

Marion No. 490, 2½ yard electric shovel.

Bucyrus-Erie 31-B steam shovel.

Steel stiff-leg derrick.

No. 6 Champion jaw crusher.

17—Used jackhammers.

Several new 50-B steam shovel parts.

New York Trap Rock Corporation
230 Park Avenue at 46th Street
New York 17, New York

Koehring crane with ¾ yard clamshell. Thew gasoline shovel. Bargains.

The Minglewood Coal & Ice Co.
Wooster, Ohio

Link Belt dragline — 2½ yard Model K595 — 85 ft. boom. Excellent condition.

Box 3447

Bucyrus-Erie model 29-B shovel and backhoe combination complete with Caterpillar D-8800 engine. Good condition. Price $12,100. F.O.B. Kentucky.

Brandeis Machinery & Supply Co.
Brook & Warnock Sts. Louisville, Ky.

Northwest model 25; 6; 80D; 95. Manitowoc 6500; 4500 new — will rent. Bucyrus 54-B; Monighan 5W; TW; 9W; 450.

A. W. Nevers Phone 32 Mt. Pleasant, Iowa

Bucyrus-Erie model 15-B ½ yd. shovel w/International UD-9 diesel engine. Machine is four years old. Good condition. Sale Price F.O.B. Louisville, Ky. $11,500.

Brandeis Machinery & Supply Co.
Brook and Warnock Streets Louisville, Ky.

Bucyrus-Erie model 10-B clamshell machine with 28 ft. boom. Powered by JXA Hercules gasoline engine. Tracks have been repaired. Generally good condition. Price F.O.B. Louisville, Ky. $3250.

Brandeis Machinery & Supply Company
Brook and Warnock Streets Louisville, Ky.

Shovels, draglines, cranes, B-E 200B, 120B, 54B, 52B, 51B, 50B, 48B, 38B, 37B, GA-3; Manitowoc 3500, Marion 40A, NW #95, #6.
Walking draglines, 3-yd. & 6-yd.
Locomotives, 7 to 45-ton, gas, diesel, steam.
Euclid 15-22 ton rear dump rock trucks.
Crushers, gyratory and jaw, large (6).
Buckeye and Parsons trench excavators (8).
Concrete batching bins; mixing plants (4).
Whirley gantry, and locomotive cranes (7).
Bottom dump cars, 36" ga., 15-25 tons (64).
Derrick boat, 15-ton, 1950 wood hull, steam.
B-Erie shovel front att., 2½-yd., 52B-55B.

H. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

SCRAPER BARGAIN

Five B-170 Bucyrus-Erie scrapers. 15 yard capacity. New 1950. Unused.

Ryan Construction Company
800 East Michigan Street
P. O. Box 34
Evansville, Indiana

1947 model TD-14 Bullgrader, cable control, double drum Heil power unit for pan work. Complete Heil blade and A-frame, new. Extra blade straight (bulldozer) to go with deal. Machine in perfect condition. Price $7200. Martin and Shortt, Clintwood, Virginia.

Complete crushing plant, first-class condition, producing 300 tons mountain stone from ¼ inch to 2 inch maximum per hour.

E. C. Schroeder Co., Inc.
McGregor, Iowa

WANTED
Backhoe attachment for 38-B Bucyrus-Erie machine.
Backhoe attachment for Model 25 Northwest.
FOR SALE OR TRADE ON ABOVE
Austin Western ⅜ cu. yd. Badger combination clamshell, crane, dragline and backhoe—$4250.
18"x36 drag conveyor Wisconsin motor, new—$1150.
18"x36 drag conveyor without motor—$900.
S-58 Bucyrus-Erie scraper (used 100 hours)—$2500.

Ferguson Corporation,
P. O. Box 480,
Hampton, Va.

12-yard dragline bucket, medium weight, excellent condition, made by Esco. Price $2400 f.o.b. Yuma, Arizona, subject to inspection.

Grafe-Callahan Construction Company
1603 First National Bank Building, Dallas, Tex.

New Dragline Buckets

3 cubic yard Red Arch, Type AY heavy duty bucket.

Bucyrus-Erie Company
Parts Division
South Milwaukee, Wisconsin

Used Dragline Buckets

1—Page — 4½ cubic yard
1—Red Arch — 5 cubic yard
3—Red Arch — 6 cubic yard
1—Red Arch — 7 cubic yard
Need repairs — will sell as is.

Box 3445

Electric Cable for Sale

1 reel — 1025 feet Coronol Geoprene mine power cable. 2-0 — AWG — 5000 V. — 3 conductor. NEW — never used.
1000 feet — portable cable — Amercad — Type SHD No. 2 — 3 conductor — 133 strand — 5000 V. NEW.
1000 feet — portable cable — same as above — slightly used — has 6 splices — all in good condition.
7000 feet — shielded preassembled aerial cable—5 KV — 2-0 — 3 conductor w/copper shielded tape — used but in good condition.

Box 3446

Continued on page 64

For Sale

Continued from page 63

A Bargain In Euclids

Eight (8) model 25 FTD Euclids with bottom dump wagons. 165 H.P. Cummins diesel engines. All units rebuilt within the past year. All in first-class operating condition. Tires ranging from good to excellent. Will sell individually or in one lot.

Write or phone for prices.

H. O. Penn Machinery Company, Inc.
140th Street and East River
New York 54, New York

Telephone: CYpress 2-4800

HELP WANTED

Dredgemasters & Winchmen

Experienced Dredgemasters and Winchmen for gold dredges operating in South America. Transportation, single status, to property and return to U. S. on completion two years work. Room, board and medical care provided free. Salary commensurate with experience and ability. Excellent opportunity for steady work. Write Mr. Albert McKee, 61 Broadway, Room 1720, New York 6, N. Y., and give full details previous training and experience.

Experienced bulldozer and grader operator. Steady work Box 3456.

POSITIONS WANTED

Position wanted as shovel, dragline, clamshell or pile driver operator. Have operated gas, steam and diesel large and small machines. Prefer steady work. P. O. Box 8, Hurricane, West Virginia. Phone 2224-Hurricane.

Coal strip-mine superintendent. 17 years experience as engineer and superintendent. Supervisory experience on all types of shovel and dragline, from ¾ to 45 cu. yds. Willing to go anywhere in U. S. Will furnish references if requested. Write 763 East Market Street, Cadiz, Ohio or phone 467-X.

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

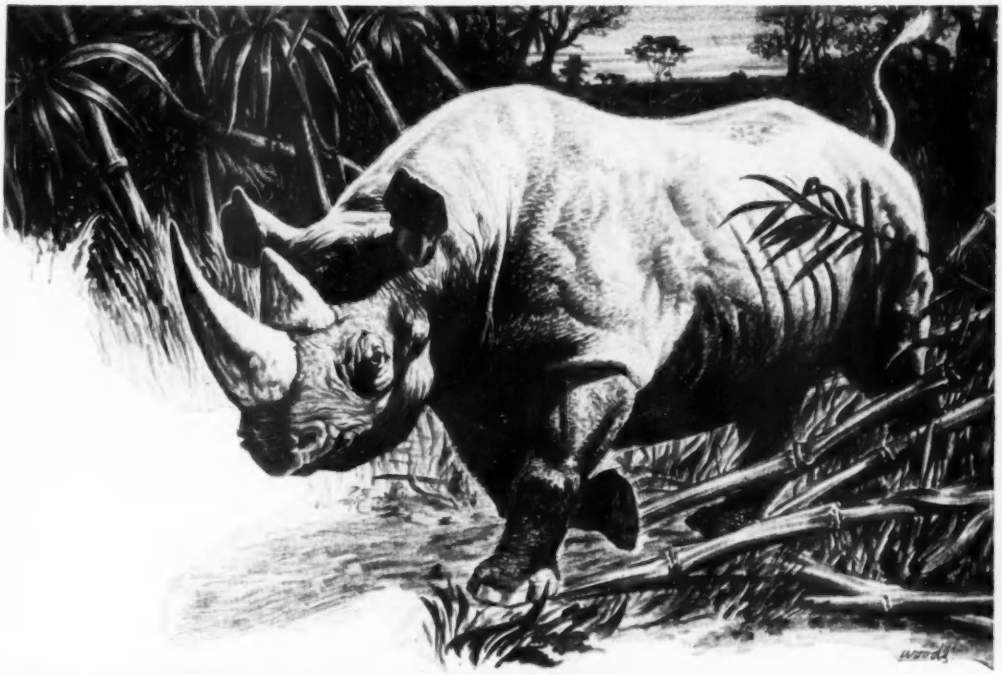
Somerville, N. J.; Red Arrow Sales Corp., No. 12 South Livingston St., Madison 3, Wis.; Martin Mfg. Co., 2000 S. San Pedro St., Los Angeles 11, Calif.; and Knox-Tenn Equipment Co., P. O. Box 3083, Knoxville, Tenn. Cleco manufactures the Cleco and Dallett lines of air tools and accessories including tools for construction, manufacturing, metal fabrication, and foundries.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announced the opening of a new factory branch at 4646 Peachtree Blvd., Atlanta (Chamblee), Ga. The new eight acre property is to be used for servicing agricultural and industrial dealers. The building is designed for the use of fork lift trucks, and a conveyor system speeds the packaging of repair parts. The modern, one-story structure has 60,000 square feet of floor space, plus 8,000 square feet of truck and rail docks.

Huber Manufacturing Co., Marion, Ohio, has named Equipment, Inc. as distributor for road maintenance equipment in the southern half of Mississippi. The firm will handle the complete line of rollers, graders and maintainers. The territory of the firm extends south from highway 82 to the Gulf Coast. Offices are on Highway 80 in Jackson, Miss. The distributing organization was formed early in April of this year. J. J. Schmelzer, Jr., is president, and Leonard R. Clark is vice-president. Schmelzer formerly was with Jones and Laughlin Steel Corp. serving as sales engineer in the Memphis office. He later joined Tri-State Equipment Co. of Memphis and Little Rock, Ark.

Welding Division of General Electric Co., Schenectady, N. Y., recently appointed the Machinery and Welder Corp., St. Louis, Mo., as a distributor for G-E stainless-steel arc welding electrodes. This is an addition to the line of G-E a-c welding equipment and mild-steel electrodes that Machinery and Welder has carried for more than 20 years, it was said. Stocks of the electrodes will be maintained in warehouses in Chicago, Milwaukee, St. Paul, Moline, and St. Louis.

"It's nice to have a sponsor, but I sure do miss the live audience."



in WIRE ROPE, too

It's all in the RIGHT KIND of Muscle

The powerful, rugged muscles of a charging rhino enable him to propel his tremendous bulk and weight at truly remarkable speed. Nature designed them well for the purpose they have to serve.

In wire rope, too, the right kind of muscle is vitally important... because different types of jobs present different types of destructive forces. Bending fatigue! Shock stress! Abrasion! Load strain! Each demands wire rope that best combines the required resistance characteristics.

Wickwire Rope gives you the benefit of long experience and specialized know-how which assures you of exactly the right kind of rope your particular job demands.

For additional information write or phone our nearest sales office.

EAST: WICKWIRE SPENCER STEEL DIV.—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • Philadelphia • New York
WEST: THE COLORADO FUEL & IRON CORP.—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
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LOOK FOR THE YELLOW TRIANGLE ON THE REEL

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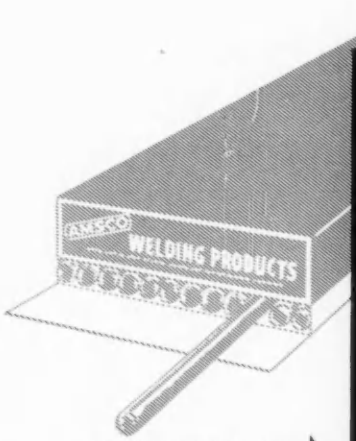
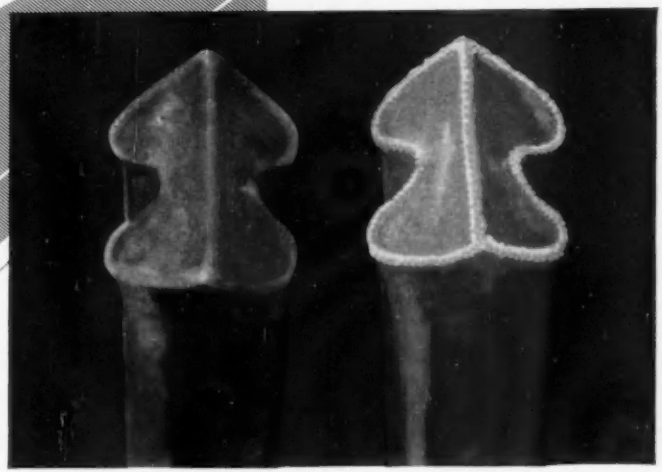


How AMSCOATING with Amsco Hardfacing Rods saves you materials . . . manpower . . . money.



Why will ONE of these bits LAST TWICE AS LONG?

AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion . . .

Find out how AMSCOATING can save you materials . . . manpower . . . money!

These bits are used by a Southern quarry for drilling blast holes. A combination of limestone and flint causes extreme abrasion—and a real problem of wear. In an attempt to cut replacement costs, labor and down-time, several makes of hardfacing rods were tried, but without much success.

Six years ago these bits were AMSCOATED with an Amsco® rod specially developed for combatting abrasion and impact.

Result? AMSCOATING did a job that had never been done before. The drill bits held their edges longer . . . averaged 60 hours of drilling—between regrinds—instead of 30. Maintenance costs and bit changes were cut in half!

AMSCOATING saves you money in terms of lower maintenance costs, less down-time . . . more production. *The actual on-the-job example cited above is one of the many applications that prove it!* Write today for illustrated catalog describing dollar-saving AMSCO rods . . . and the name of your nearest AMSCO distributor.

AMSCOATING

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